



Department of Energy

Nevada Operations Office
P. O. Box 98518
Las Vegas, NV 89193-8518

WBS # 1.2.6.1
"QA"

OCT 21 1988

NN1.881021.0055

Paul T. Prestholt, NRC, Las Vegas, NV
James R. Grubb, NWFO, Carson City, NV



EXPLORATORY SHAFT FACILITY (ESF) TITLE I - 100 PERCENT TECHNICAL ASSESSMENT REVIEW RECORD MEMORANDUM

Enclosed are copies of the Yucca Mountain Project ESF Title I - 100 Percent Technical Assessment Review Record Memorandum (Volumes 1, 2, and 3) for the review held in Henderson, Nevada, August 8 through September 9, 1988.

Briefly, the review record memorandum is a comprehensive document that provides a record of the review process, comment disposition and resolution, and findings and recommendations.

Should additional information be required, please contact John K. Robson of my staff at (702) 794-7933.

Carl P. Gertz, Project Manager
Yucca Mountain Project Office

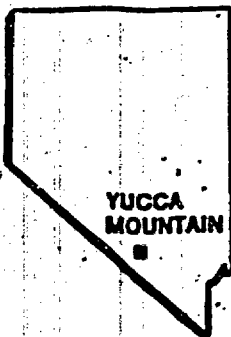
YMP:JKR-302

Enclosure:
ESF Review Record
Memorandums, Volumes 1, 2, and 3

cc w/o encl:
Ram Lahoti, HQ, (RW-223) FORS
G. K. Beall, SAIC, Las Vegas, NV
I. R. Cottle, SAIC, Las Vegas, NV
S. H. Klein, SAIC, Las Vegas, NV
J. G. Reiser, SAIC, Las Vegas, NV
James Blaylock, YMP, NV
E. L. Wilmot, YMP, NV

BB11140422 881026
PDR WASTE
WM-11
PDR

U.S. DEPARTMENT OF ENERGY

Y
M
P
/

YUCCA MOUNTAIN PROJECT

YUCCA MOUNTAIN PROJECT EXPLORATORY SHAFT FACILITY TITLE I 100 PERCENT TECHNICAL ASSESSMENT REVIEW REVIEW RECORD MEMORANDUM

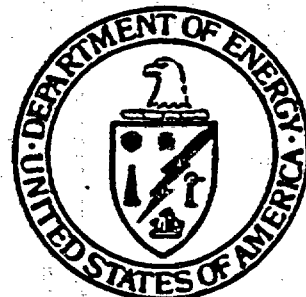
VOLUME 1

Received w/Ltr Dated

10/26/88

~~10/26/88~~**AUGUST 1988**

UNITED STATES DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE/YUCCA MOUNTAIN PROJECT OFFICE



102

TABLE OF CONTENTS

VOLUME 1

Technical Assessment Review Committee (TARC) Approval & Signature Sheet

- 1.0 Findings and Recommendations of the TARC of the Exploratory Shaft Facility Title I 100 Percent Design Completion**
- 2.0 Technical Assessment Review Checklist**
- 3.0 Comments Disposition and Resolution, (including items in Dispute Process)**
- 4.0 Technical Assessment Review Plan**
- 5.0 List of Reviewers (By Name, Organization, Discipline, and Comment Reference Number Summary)**

VOLUME 2

- 6.0 Comment Statistics and Reviewer's Comment Sheets (Including 50 Percent Design Review Comment Verification)**
- 7.0 10 CFR 60 Compliance Review**

VOLUME 3

- 8.0 Documentation of Technical Assessment Review Notifications and Identification of Reviewers Transmittals**
- 9.0 Technical Assessment Review Team Selection Record, and Reviewer Qualifications**
- 10.0 Meeting Presentation Materials, including Agenda**
- 11.0 Attendance Lists**
- 12.0 Design Basis Library**

**1.0 Findings and Recommendations of the TARC of the Exploratory Shaft
Facility Title I 100 Percent Design Completion**

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS PROJECT

TITLE I - TECHNICAL ASSESSMENT REVIEW

FOR THE EXPLORATORY SHAFT FACILITY

AT 100 PERCENT DESIGN COMPLETION

REVIEW RECORD MEMORANDUM

Review Meeting: August 8, 1988

Report Issued: October 10, 1988

Technical Assessment Review Committee Approval

Date

G. K. Beall (Chairman)

G.K. Beall 10/7/88

J. G. Reiser (Secretary)

Joseph G. Reiser 10-5-88

P. J. Karnoski (Quality Assurance)

P.J. Karnoski 10/7/88

M. C. Brake (Civil/Structural/Architectural)

MARCE BRAKE 84 In little

E. M. Cikanek (Geotechnical/Testing)

Edward M. Cikanek 10/7/88

R. Tome' (Mechanical)

R.T. Tome' for E. Tome' 10/7/88

I. R. Cottle (T&MSS Lead Reviewer)

I.R. Cottle 10/7/88

J. H. McConville (Electrical)

James H. McConville

T. H. Pysto (Environmental)

Thomas H. Pysto

S. C. Smith (Repository/Operations)

Steve Smith 10/7/88

A. L. Langstaff (Mining/Shaft/Ventilation)

A.L. Langstaff 10/7/88

S. W. Phillips (Safety)

S.W. Phillips 10/7/88

J. M. Davenport (Regulatory Compliance)

J.M. Davenport 10/7/88

PREFACE

The focus of this review is to provide a Technical Assessment of the ESF Title I Design at 100 percent completion and to document the review comments and resolutions. The review purpose was to determine whether the design meets the criteria provided to the Architect-Engineers (A/Es) in the Project approved Title I Scope and Planning Documents, for a preliminary design.

To support the assessments required, the Yucca Mountain Project Office invited seventeen (17) reviewing and four (4) observing organizations to participate in the review process, of which fifteen (15) reviewing organizations participated. The reviewing organizations provided a total of fifty-one (51) reviewers representing the technical/scientific disciplines required for the technical review of the A/Es design drawing, specifications, etc.

The review process started on August 8, 1988 and was completed on September 9, 1988. The process developed eleven hundred and seventy-two (1172) comments, of which only five (5) remain in dispute by the reviewers. It is the responsibility of the reviewer to present his/her concerns in writing to the next higher level of project authority for a decision.

As part of the 100 Percent Title I ESF Technical Assessment Review (TAR) the design submitted by the Architect/Engineers (A/Es) was subjected to a review for compliance with 10 CFR 60. A proposed checklist of the regulations in 10 CFR 60 that apply to the design of the ESF, considering eventual incorporation into the repository system, was developed by the Nuclear Regulatory Compliance Division (NRCD) of the T&MSS contractor (SAIC). The list was developed using 10 CFR 60, input from other T&MSS staff members, and notes from recent NRC interactions. Prior to conducting the review, the NRCD presented this list to the organizations assigned the responsibility of conducting the compliance review. Assignments of responsibility were made by the NRCD and the Project participants based on the scopes of Project work of the participants. During two workshops a final checklist to be used by the organizations was finalized. The review itself consisted of the responsible organization assessing the compliance of the design with the assigned 10 CFR 60 regulation(s) and supplying a short justification of that assessment on forms provided by the NRCD. The reviewing organizations determined that the ESF design complied with 15 of the 20 applicable 10 CFR 60 regulations. Please note that an additional evaluation (of 10 CFR 60 - General Comment) was completed during the review. In all cases where the reviewers determined the design was not in compliance with the regulations, a comment was submitted to the proper Architect/Engineer (A/E). Listed below are the regulations to which the reviewers felt the ESF - design was not in compliance and the number of the comment made by the reviewer to the A/E addressing this non-compliance:

| | |
|--|--------------------------|
| 10 CFR 60 - General Comment | Comment No. S.MI.RES.004 |
| 10 CFR 60.75 - NRC Office Space | Comment No. T.AR.JMD.003 |
| 10 CFR 60.113(a)(1) - Postclosure Performance by Engineered Barrier System | Comment No. L.MI.DGW.018 |
| 10 CFR 60.133(b) - Flexibility of Design of Underground Facilities | Comment No. S.GE.TEB.001 |
| 10 CFR 60 - Subpart F - Performance Confirmation Program | Comment No. S.MI.RES.004 |

All comments submitted to the A/Es as a result of this exercise were dispositioned satisfactorily to both the reviewer and the A/E, indicating that the reviewer believed the design either complied with the regulation or would comply with the regulation once the agreed-upon action had been completed. For more details, see Section 7.0, Volume 2, "10 CFR 60 Compliance Review of this memorandum.

The Exploratory Shaft Facility Title I-100 Percent Design completion Technical Assessment Review was conducted in accordance with Quality Management Procedure QMP-02-08 and the approved plan, which among other requirements calls for the Technical Assessment Review Secretary to provide "Meeting Minutes" of the review activities, and "Review Record Memorandum". No attempt was made to produce a daily verbatim transcription of the interchange between the fifty-one Reviewers and their counterparts on the Architect-Engineers design teams. This decision is based upon the fact that the resulting culmination of the dialogue between the parties is represented in the final documentation of the Reviewer's Comments Sheets and the Architect-Engineers Comments Resolution Sheets as accepted by the parties, and this three Volume Review Record Memorandum constitutes relevant meeting minutes. Both sets of "records" referred to above have been included in Section 6.0 Volume 2 and Section 3.0 Volume 1 respectively of this memorandum. Where a workshop was conducted and meeting minutes were considered to be either useful or necessary, they have been provided, (i.e. "Concerns Related to 10 CFR 60" Section 7.0 Volume 2 of this memorandum).

Additionally, Reviewers were asked to verify that his/her organization's comments from the ESF Title I-50 Percent Design Review had been incorporated. The reviewer's responses are contained in either the reviewer's restatement of the comment in this review or in a separate stand alone statement, included in this document.

Lastly, from a review checklist, the Technical Assessment Review Committee Discipline Coordinators (TARC) prepared responses in accordance with their area of technical expertise. Section 1, Volume 1.0 Findings & Recommendations were developed from the Discipline Coordinates Responses. This Review Record Memorandum is a comprehensive document, which provides an in depth report of the Technical Assessment Review activities. Briefly, this memorandum includes the following key activities and/or documents:

- o The DOE approved Plan used to implement the QMP-02-08 review process.
- o Presentations to Reviewers provided to highlight the review process and the reviewers' responsibilities.
- o Identification of the reviewing organizations, their respective scopes and qualified reviewers.
- o Comment and resolution acceptance documentation.
- o TARC Team Findings and Recommendations as appropriate, based on a checklist evaluation by TAR Team Members.
- o Comment Resolution Concurrence and Items in dispute process.
- o Other items as identified in the Table of Contents of this memorandum

Joseph G. Reiser, Secy
Technical Assessment Review

FINDINGS AND RECOMMENDATIONS
OF THE TECHNICAL ASSESSMENT REVIEW COMMITTEE
OF ESF TITLE I 100 PERCENT DESIGN COMPLETION

SECTION 1.0

Based on the performance of the Exploratory Shaft Facility (ESF) Title I - 100 Percent Technical Assessment Review, with emphasis on a Management and Technical Assessment, the Technical Assessment Review Committee has developed the following findings and recommendations with respect to the A/E's design effort submitted jointly by Holmes & Narver, Inc. (H&N) and Fenix & Scisson, Inc. (F&S).

FINDINGS AND RECOMMENDATIONS

o SAFETY ANALYSIS

Numerous changes have been made in the design to address comments related to safety that were developed in the 50 Percent design review. Notably, both the surface and underground layouts were modified to improve safety, tapered guides were added to the headframes, a truck-mounted emergency hoist was added, the hoist house was divided with a barrier wall to isolate the hoists from each other, fire protection capability underground was augmented, a dust collection system was added to the underground ventilation system, and noise control measures were specified for ventilation equipment.

Several commentators identified safety concerns during the 100 Percent Title I Technical Assessment Review. Approximately 240 comments were related to safety. The issues raised have been considered by the A/Es and agreements were reached to make appropriate design changes. This process provides some confirmation that certain aspects of the design are adequate with respect to occupational safety requirements, particularly those aspects which are governed by published standards and codes. The Technical Assessment Review does not provide a systematic review of all potential hazards associated with the design and operation of the ESF, nor has the A/E completed such a review or analysis.

Currently, at the completion of ESF Title I work, the basis to conclude that the design wholly satisfies the Subsystem Design Requirements Document (SDRD) requirement for the provision of a safe workplace is incomplete. According to DOE Order 6430.1A, a Preliminary Safety Analysis must be initiated in the Conceptual Design Phase and further developed during Title I and Title II. The Project Office has directed the A/Es to perform and document a systematic review of all potential design and operations related hazards during the ESF Title II design. The resolution of F&S General Comment 3 shows that a Safety Analysis Plan is being prepared and will be available prior to the end of Title I, and the Safety Analysis will be

scheduled to be completed in Title II. Therefore, it is concluded that the design, when properly matured during the ESF Title II work, will satisfy the SDRD requirement to provide a safe workplace.

In some cases, it may be appropriate to exceed the minimum requirements imposed by codes and standards. A safety analysis would identify these cases.

o CONFORMANCE TO NEVADA TEST SITE (NTS) STANDARDS

Several comments focused on the identification and interpretation of applicable standards. A related concern is the process by which the A/E reviews the design against safety requirements to determine that the design complies with all applicable requirements. One comment suggested a checklist approach and a second comment suggested documenting interpretations of regulatory requirement.

o QUALITY ASSURANCE (QA)

Two areas of concern, both related to Quality Assurance Level were presented identifying the QA level of items/activities shown on a drawing or in a specification, and a definition of the QA Level I activity, "Fluid control." It is suggested that the Project make a study of the fluid control requirements and define the limits, if any of the QA Level I parts of the water carrying systems and incorporate into the SDRD for Title II Design.

o QUALITY

While improvement was apparent in the quality of the drawings prepared by the A/Es, over the 50 Percent Design Review, 3 comments were made which are typical of the inadequacy of checking of the drawings and specifications by both A/Es. Typical among the discrepancies were errors of spelling, incorrect or confusing symbols, incomplete or incorrect cross-references between drawings, and inconsistency of details on different drawings or views.

o ENVIRONMENTAL REQUIREMENTS

In general, the 100 Percent Review established that the majority of the environmental requirements were being addressed. The approximately 50 comments were considered by the A/Es and agreements were reached which resolved the concerns of the reviewers, including agreements to incorporate necessary design changes to meet permitting requirements.

ple

2.0 Technical Assessment Review Checklist

Reiser
9/22/88

EXPLORATORY SHAFT FACILITY (ESF) TITLE I 100 PERCENT TECHNICAL ASSESSMENT REVIEW
CHECKLIST

DISCIPLINE
COORDINATOR

QUESTIONS

- | | |
|---------------|---|
| Each | 1. Does the design comply with the Subsystem Design Requirement Document (SDRD), its references, and the Reference Information Base document (RIB)? |
| Ed Cikanek | 2. Does the design accommodate testing, considering the current level of detail (100 Percent)? |
| Each | 3. Is the design feasible (constructable and operable), considering the current level of detail (100 Percent)? |
| Joe Reiser | 4. Have the A/Es provided the deliverables, for the 100 Percent Technical Assessment Review, as identified in the WMFO approved Planning and Scoping documents? |
| Each | 5. Are necessary design interfaces properly identified, considering the current level of detail (100 Percent)? |
| Stan Phillips | 6. Is the design adequate with respect to occupational safety requirements, considering the current level of detail (100 Percent)? |
| Pete Karnoski | 7. Have any Quality Assurance (QA) concerns been identified by the design review? |
| Tom Pysto | 8. Does the design reflect ESF environmental requirements, considering the current level of detail (100 Percent)? |
| M. Davenport | 9. Has the Technical Assessment Review identified any issues which could impact future licensing considerations? |
| Each | 10. Have the drawings and/or specifications received adequate checking? |
| Each | 11. Have any comments been unresolved or resolutions in dispute? |

NOTE: Responses check list questions should be answered in the context of the reviewers comments received, and provide evidence, see attached examples.

Please provide responses to Joe Reiser by Wednesday, September 28, 1988, COB.

cc: K. Beall
I. Cottle

CHECK LIST QUESTION ANSWER

EXAMPLES

6. Is the design adequate with respect to occupational safety requirements, considering the current level of detail (50 percent)?

There is a reasonable basis to conclude that the design process will adequately address occupational safety requirements. Safety features are being incorporated into the design to the extent feasible within the constraints imposed by baselined requirements. Safety concerns have been raised by 8 reviewing organizations, representing both regulatory and operational perspectives. The issues raised have been considered by the A/Es, and agreements were reached to make appropriate design changes.

Approximately 200 comments were related to safety aspects of the design. A list of these comments is provided in Section 6. The majority of these related to compliance with applicable standards, and were resolved either because the A/Es agreed to incorporate the reviewer's suggestion, or because the A/Es defended their interpretation of the requirement to the reviewer's satisfaction.

A smaller number of comments relate to the SDRD requirement to provide a safe workplace (SDRD, Section 1.2.6.0, Performance Criteria 7, Constraints 4 and 6; Section 1.2.6.1, Performance Criteria 1, etc.) The underground A/E agreed to perform a safety analysis as part of the Title I deliverable (General comment GP-017). Issues that need to be included in the context of this safety analysis include:

- o Adequate separation of the hoists, hoist control rooms, and/or hoist utility systems so that a catastrophic failure of one hoist does not disable both (Shaft comments P-009, P-074, P-078, P-079, and P-085)
- o Adequate protection of scientific personnel using the shaft sinking stage as a work platform for test activities (Shaft comments P-095, P-100, P-132, P-144, P-145, P-146)
- o Ability of the ventilation design concept to provide an adequate supply of air during all phases of construction and operation, and to function under emergency conditions that may be associated with credible mishaps (Mining comments I-113, I-114, I-115)
- o Adequate margin of safety in structures associated with the shaft conveyances, including provision for emergency stop conditions and overtravel protection (General comments GF-016; Shaft comment P-164)
- o The degree of risk imposed by the proposed shaft station layout which intersects drifts at a 45 degree angle (General comment G-013; Shaft comments P-008, P-172).

In addition to the issues to be addressed in the A/E safety analysis, some fire protection requirements will be determined by the A/E after discussions with the local fire protection authority. These discussions will include; 1) the transfer of diesel fuel from surface to underground locations (Mining comment I-026; Shaft comments F-067, F-072), and 2) fire protection systems for underground transformers and related electrical equipment (Mining comments I-082, I-083, I-084, I-085).

7. Have any Quality Assurance (QA) concerns been identified by the design review?

After reviewing the drawings provided by both Fenix & Scisson (F&S) and Holmes & Narver (H&N), and the specifications provided by F&S, the following Quality Assurance Level Assignment Sheets (QALAS) related concerns were identified:

- o QALAS need to be specified or referenced in some form, as appropriate, on all design documents
- o The relationship between the QALAS and the appropriate drawings and specifications must be identified. (As a minimum, drawings need to reference QALAS source information relative to the content of the drawing. F&S General comment GF-053.)

Additionally, the appropriate quantitative and/or qualitative acceptance criteria for sampling, testing, and inspection must be shown or referenced on applicable documents.

Vendor QA programs, when required, must be approved by the A/Es QA organization.

No H&N specifications were available for review during the 50 Percent Design Review. H&N must provide all of their Title I specifications at the final 100 Percent Design Review.

The A/Es provided satisfactory resolutions for all QA concerns raised as comments during the completion of the 50 Percent Design Review.

8. Does the design reflect ESH environmental requirements, considering the current level of detail (50 percent)?

In general, the 50 Percent Review established that the majority of the environmental requirements were being addressed. The exceptions that needed clarification included:

- o Storage and disposal of chemical and hazardous wastes (Civil comments C-037, C-039, C-060, C-016, C-017; Architectural comment A-013)
- o Fuel handling and storage (Civil Comments C-060; Mining Comments I-011, I-026, I-060)

SECTION 2.0

EXPLORATORY SHAFT FACILITY (ESF) TITLE I-100 PERCENT TECHNICAL ASSESSMENT REVIEW CHECKLIST

1. Does the design comply with the Subsystem Design Requirement (SDRD), its references, and the Reference Information Base document (RIB)?

o Civil, Architectural, and Architectural/Structural

Yes, the current level of design in the H&N Civil, Architectural, and Architectural/Structural areas comply with the SDRD requirements and needs with the following exceptions:

There were two comments on the SDRD requirement for a chemical storage area (H&N Architectural 8 [T.AR.SWP.002] and H&N Architectural 15 [T.AR.THP.036]) that was not identified in the Title I submittal.

There was one comment on the DOE Order DOE 6430.1A requirement for 8" water mains where 6" are now shown in the design (H&N Civil 26 [N.CI.PEP.026]).

There was one unincorporated comment from the 50 percent review on the conflict between the waste water design and the SDRD criteria for offsite disposal of the waste water (H&N Civil 120 [T.CI.THP.002]).

o Mining/Shaft/Ventilation and Civil

Minor discrepancies exist which the A/E has agreed to fix, e.g. number of boreholes for tests; F&S Mining Comment #7 Upper Demonstration Breakout Room (UDBR) dimensions; F&S Mining Comment #8 and heater hole length; F&S Mining Comment #63.

o Geotechnical/Testing

From a testing support standpoint, the design complies with the SDRD. Several comments identified errors in the test details shown, but these were caused by recent changes that had not been incorporated into the SDRD, and thus could not be used by F&S (MI-19, MI-22, MI-61) or else were simply minor drafting errors (MI-51, MI-63, MI-64).

No comments identified use of data that disagree with that in the RIB.

o Mechanical

No mechanical-related issues were identified that would indicate that the ESF Title I design does not comply with the SDRD, its references, or the RIB.

- o Electrical

The electrical power system feed from the Nevada Test Site (NTS) source, the substation, the primary and secondary distribution system and the standby generator system design fairly and adequately meets the Subsystem Design Requirement Document and its references, and the reference information base document.

The communication systems should comply with the requirements in these reference documents now that two Engineering Change Requests submitted by Holmes and Narver - Facility Design & Support Contractor (surface/NTS) (H&N) to clarify the shaft and hoist communication requirements have been approved.

- o Environmental Design

In general, the 100% Review established that the majority of the environmental requirements were being addressed. Approximately 50 comments were related to the environmental aspects of the design. The comments were considered by the A/E's and agreements were reached which resolved the concerns of the reviewers. See Question No. 8 below for specific concerns.

- o Repository/Operations

The current 100% level of design does comply with the SDRD and RIB requirements and needs as interpreted by the A/E's. However, some concern was expressed about the correctness and/or completeness of the supporting SDRD reference documents identified in some cases, especially those dealing with life and fire safety and also electrical installations. All concerns expressed were resolved satisfactorily.

- o Safety

See Question 6 below.

- o Regulatory Compliance

Within the limits of this review, it is concluded that the design does comply with the appropriate design requirements documents.

2. Does the design accommodate testing considering the current level of detail (100 Percent)?

- o After considering all Exploratory Shaft Facility (ESF) Title I Design related factors, the 100 Percent Title I Design does indeed accommodate testing. Approximately 4 percent of the comments transmitted during the 100 Percent Design Review were testing related. The comments developed were in the following general areas:

- Shaft conveyance and access to test locations before and after shaft outfitting (SH-23, SH-31, SH-36).
- Terminology and test details (greatest number off comments).
- Flexibility to accommodate testing changes (MI-21, SH-24).
- ECR's needed to change certain test details (MI-19, MI-61).
- Excavation dimensions must change to
 - promote success in smoothwall blasting (MI-55)
 - allow instrument installation (MI-61)
- IDS alcoves must be shown (SH-1, SH-2, MI-61).
- Excavated geometry possibly interferes with nearby testing (MI-50, SH-97).

As indicated by the above, the vast majority of testing related comments indicated no conditions adverse to support of testing. The few adverse conditions indicated were not serious and will be corrected during Title II design. Resolution for most of the other comments involve clarification and consistency of details and information, which will also be accomplished during Title II.

3. Is the design feasible (constructable and operable), considering the current level of detail, (100 Percent)?

o Civil, Architectural, and Architectural/Structural

No major problems were identified to indicate that the surface design would not be constructable or operable. Concerns as to the effect of certain design aspects would have on the ease of operation of the ESF surface facilities were identified in the following areas:

There were several comments on the operability of the IDS design. Two were concerned with the sunken floor in the computer area (H&N Architectural 34 and 36 [A.AR.TJM.015 and J.AR.RDE.003]) and the drainage in that area. Another comment identified non baselined criteria about the need of the building 3 months before data collection begins for set up and check out (H&N Civil 15 A.CI.TJM.007).

There was a comment on the dust hazard of the muck storage and its impact on the underground ventilation for the ESF (H&N Civil 7 B.CI.BC.010).

There were two comments on the location of the batch plant, aggregate stockpile, septic disposal system, and the mine waste water system and the interference with an area currently being constructed for drilling storage (H&N Civil 31 and 32 [R.CI.DLK.001 and R.CI.DLK.002]).

- o Mining/Shaft/Ventilation and Civil

Some minor design modifications will be needed in Title II design phase to facilitate construction and operations as exemplified by F&S Mining Comments #56 and 57 concerning drift enlargement, and F&S Shaft Comment #31 and 36 (accessing test locations), and Shaft Comment #126 (sump pump location).

- o Mechanical

No major mechanical-related problems were identified that would indicate that the ESF design would not be constructable or operable. However, some design-related concerns were identified in the following areas:

- The fire protection system relative to control of the water supply (F&S comment PI-013), surface and underground sprinkler systems (H&N comments FP-008, FP-084, and FP-089), the underground fueling area (H&N comments FP-004 and FP-006), smoke detection (H&N comments FP-030 and FP-035), and the surface data building (H&N comments FP-068, FP-070, FP-076, and FP-077).
- Hoist resistor banks sizing (H&N comment ME-053) and cooling (H&N comment ME-054).
- Conditioned air for the surface data building (H&N comments ME-060, ME-061, and ME 062).
- The A/E's have agreed to evaluate and resolve these issues during the ESF Title II design.

- o Electrical

The electrical power design is feasible to construct and with the possible exception of the standby generators, it is operable. More detailed information (Title II) regarding the standby generator loading is needed before the operational success of the standby generator can be insured.

The communication system design utilizes directly available subsystems and is easily installed. The subsystems should meet the operational needs, even if they change as the details of the operations become apparent.

o Regulatory Compliance

Although some concerns exist over the regulatory compliance of the Exploratory Shaft Facility, no issues have been identified at this point that could impact future licensing. As the design matures during Title II, special attention will be paid to these concerns to ensure the design complies with applicable 10 CFR 60 regulations and has no negative impacts on eventual repository licensing.

o Repository/Operations

No major problems were identified during the ESF Technical Assessment Review to indicate that the ESF Design would not be constructable or operable. Concern was expressed over the availability of space for contractor development and operational support space in the underground. All concerns expressed were resolved satisfactorily.

4. Have the Architect-Engineers (A/Es) provided the deliverables, for the 100 Percent Technical Assessment Review, as identified in the WMPO approved planning and scoping documents?

- o Yes, required deliverables for the ESF Title I-100 Percent Technical Assessment Review include the following number of drawings and specifications from the A/Es:

| <u>Drawings</u> | | | <u>Specifications</u> | | |
|-----------------|-----|--------------|-----------------------|--|--------------|
| No. Required | | No. Received | No. Required | | No. Received |
| H&N | 128 | 130 | 123 | | 124 |
| F&S | 103 | 84 | 78 | | 76 |

The significant difference of F&S drawings and specifications "Required" and those "Received" resulted from the comments accepted during the ESF Title I 50 Percent Design Review. As the design developed it became apparent that:

- Both shafts could use the same sinking deck and concrete forms,
- Shaft bottom changes resulting from new loadout, no bucket elevator, and new shaft bottom clean-out,
- And the Calico Hills Breakout level development was eliminated.

These changes resulted in the deletion of some 33 drawings and 2 specifications from the original list. Additionally, 14 new drawings were added for a total of 84 drawings and 76 specifications Received. See Question 10 below for concerns relating to the drawing quality standards and practices.

5. Are necessary design interfaces properly identified, considering the current level of detail (100 Percent)?

o Civil, Architectural, and Architectural/Structural

The basic interfaces are being identified in accordance with AP-5.6Q. One minor instance of an interfacing problem between the A/Es is apparent in the current design as shown in H&N Civil comment 16 (F.CI.JAJ.027). A larger problem is apparent; however, in the interfaces between the Project Office and the Nevada Test Site Office (NTSO). This is shown through the H&N Civil comments 31 and 32 (R.CI.DLK.001 and R.CI.DLK.002).

o Mining/Shaft/Ventilation and Civil

Some discrepancies exist with respect to items shown on F&S drawing vs. H&N drawings; examples F&S Civil Comment 1 concerning Buildings 10 and 11 and Civil Comments #24 and 25 concerning barrier wall between ES-1 and ES-2 hoists. The A/E has agreed to conform to H&N drawings.

o Mechanical

Are necessary design interfaces properly identified, considering the current level of detail (100 percent)?

The basic mechanical design interfaces have been identified in the Title I 100 percent design. However, a number of interface-related discrepancies were identified on the A/E drawings (F&S comment PI-014 and H&N comments ME-005 and ME-034). The A/Es have agreed to correct these discrepancies during ESF Title II design.

o Electrical

Those interfaces necessary to complete the Title I electrical power system design are evident.

The communications system interfaces are obvious and have been adequately addressed for the Title I design.

o Regulatory Compliance

All interfaces checked during the Review were properly identified.

o Repository/Operations

The basic design interfaces have been identified in the Interface Control Plan (ICP) portion of SOP 03-05 and through the ICWG; the A/Es are aware of this. Only minor instances of a lack of interfacing between A/Es are apparent in the current design. These instances occur in the surface area of the design where main pad layouts overlap between AE's. All inconsistencies identified were resolved satisfactorily.

6. Is the design adequate with respect to Occupational Safety Requirements, considering the current level of detail (100 Percent)?

Numerous changes have been made in the design to address comments related to safety that were developed in the 50 Percent design review. Notably, both the surface and underground layouts were modified to improve safety, tapered guides were added to the headframes, a truck-mounted emergency hoist was added, the hoist house was divided with a barrier wall to isolate the hoists from each other, fire protection capability underground was augmented, a dust collection system was added to the underground ventilation system, and noise control measures were specified for ventilation equipment.

Several commentators identified safety concerns during the 100 Percent Title I Technical Assessment Review. Approximately 240 comments were related to safety. The issues raised have been considered by the A/Es and agreements were reached to make appropriate design changes. This process provides some confirmation that certain aspects of the design are adequate with respect to occupational safety requirements, particularly those aspects which are governed by published standards and codes. The Technical Assessment Review does not provide a systematic review of all potential hazards associated with the design and operation of the ESF, nor has the A/E completed such a review or analysis.

Currently, at the completion of ESF Title I work, the basis to conclude that the design wholly satisfies the Subsystem Design Requirements Document (SDRD) requirement for the provision of a safe workplace is incomplete. According to DOE Order 6430.1A, a Preliminary Safety Analysis must be initiated in the Conceptual Design Phase and further developed during Title I and Title II. The Project Office has directed the A/Es to perform and document a systematic review of all potential design and operations related hazards during the ESF Title II design. The resolution of F&S General Comment 3 shows that a Safety Analysis Plan is being prepared and will be available prior to the end of Title I, and the Safety Analysis will be scheduled to be completed in Title II. Therefore, it is concluded that the design, when properly matured during the ESF Title II work, will satisfy the SDRD requirement to provide a safe workplace.

In some cases, it may be appropriate to exceed the minimum requirements imposed by codes and standards. A safety analysis would identify these cases.

Some of the issues that need to be included in the safety analysis were listed in the 50 Percent Design Review Report. These issues are:

- o Adequate separation of hoists, hoist control rooms, and hoist utility systems,
- o Adequate protection of scientific personnel using the shaft sinking stage as a work platform for test activities,

- o Ability of the ventilation system to provide an adequate supply of air during all phases of construction and operation, and to function under emergency conditions,
- o Adequate margin of safety in structures associated with shaft conveyances,
- o The degree of risk imposed by the proposed shaft station layout which intersects drifts at a 45 degree angle,
- o The minimization of fire risk associated with the transfer of diesel fuel from the surface to underground vehicles.

Some of these concerns drew additional comments during the 100% review, as indicated below:

- o Safe access to the test locations in the shaft (F&S General Comment 15; F&S Shaft comments 1, 2, 11, 31, 36, 83, 84, and 87).
- o Underground fuel storage (F&S Mining Comment 30 and H&N Mechanical Comment 4).
- o Adequate ventilation (F&S Ventilation Comments 2, 3, 4, 5, and 10).

Other safety concerns that were raised in the 100% review include:

- o The need for an on-site ambulance and fire truck (General Comment 60).
- o Design criteria for ground support and pillar width (F&S General Comment 16, F&S Mining comments 23 and 128).
- o Safety and reliability of the life safety and operations control system (F&S Piping and Instrumentation Comments 1, 3, 6, 10, and 11 and H&N Mechanical Comments 15, 16, and 17).

Several comments focused on the identification and interpretation of applicable standards (General Comments 28, 29, 33, 35, 56; H&N Architectural Comments 1 and 33, Architectural/Structural Comments 13, 14, 18, 30, 36, 42 and 59; F&S Mining Comments 48, 70, 105, and 146). The resolution of F&S Mining Comment 48 assumed DOE acceptance of the regulatory interpretation stated therein. DOE acceptance needs to be documented separately.

A related concern is the process by which the A/E reviews the design against safety requirements to determine that the design complies with all applicable requirements. One comment suggested a checklist approach (General comment 24) which the A/E agreed to consider, and a second comment suggested documenting interpretations of which regulatory requirements are applicable to this design (General comment 23), to which the A/E agreed.

7. Have the Quality Assurance (QA) concerns been identified by the Design Review?

Two areas of concern, both related to Quality Assurance Level were presented in our closing comments: identifying the QA level of items/activities shown on a drawing or in a specification, and a definition of the QA Level I activity, "Fluid Control."

The first concern is addressed in comment T.GE.PJK.003 for F&S drawings: "The QALAS stamp is acceptable for Title I drawings only. Its use will be impractical for procurement and construction because it will put the responsibility of QALAS interpretation on others than the technical authors of the design; therefore, subsequent issues of F&S drawings should identify the applicable QALAS for each drawing in the drawing notes."

A comment on the H&N drawings was: "Place QA level along with QALA reference on each drawing. (R.GE.MAF.010).

The intent of both comments was to identify with some detail, the QA level of items which would have to be procured and constructed, not leaving that decision to a procurement or construction individual. The method for doing this was postponed for the Title II design phase by the AEs, leaving the decision on how it was to be accomplished until the next TAR.

When the methods are determined, they should be similar so that the procurement and construction operations can be performed with a minimum of errors.

The second concern was stated in Comment No. A.ME.TJM.005. "The quality level of valves, meters and fittings that could affect fluid control should be Quality Level I. See QALA 1.2.6-0001. It appears that failure of this component could cause uncontrolled spillage of water in the ESF."

The comment recognizes the QA Level of the fluid control activity, but the question given to the Project Office was about the components and construction of the many systems which would be containing water on the site. It was suggested that the Project Office request Los Alamos to make a study of the fluid control requirements and define the limits, if any of the QA Level I parts of the water carrying systems.

8. Does the design reflect ESF Environmental Requirements considering the current level of detail (100 Percent)?

In general, the 100% Review established that the majority of the environmental requirements were being addressed. Approximately 50 comments were related to the environmental aspects of the design. The comments were considered by the A/E's and agreements were reached which resolved the concerns of the reviewers.

The areas of concern included:

- o Environmental permitting requirements affecting ESF facilities.
- o Dust control, compliance, and reclamation (G-25, C-224, C-227, C-228, C-230, C-234, C-235).
- o Dust control procedures for the ESF Activities (C-176, C-219, S-136, S-143, S-148).
- o Activities related to reclamation (C-173, C-182, C-183, C-186, C-192, C-200, C-218).
- o Fuel Handling and Chemical Storage (A-7, A-15, C-36, C-82, C-83, C-84, M-6, ME-141, M-147, and E-37).
- o Design of Muck Storage Area (C-97, C-98, C-110, C-111, and C-173).

There are several areas where permitting requirements may require additional work. These include:

- o Underground Storage Tank Requirements (C-83, C-84, and E-37).
- o Air quality Requirements (E-38, C-147, and G-25).
- o Mine Wastewater Quality (C-119).

Six comments from the 50% Title I Review were restated for the 100% review. One resolution (regarding the Mine Wastewater System (C-170) requires an ECR to change the SDRD. This ECR will be prepared and submitted by H&N.

The A/As have agreed to incorporate the necessary design changes to meet permitting requirements. Discussion with the appropriate agencies will be held to determine permitting applicability and requirements.

9. Has the Technical Assessment Review identified any issues which could impact future Licensing considerations?

No issues that could impact future licensing considerations were identified during the Exploratory Shaft Facility (ESF) 100% Title I Technical Assessment Review (TAR).

Included in the ESF 100% Title I TAR was an exercise by Project participants to check the ESF design for compliance with the applicable 10 CFR 60 regulations. During two workshops, the list of applicable 10 CFR 60 regulations, review procedures, required documentation, and review responsibilities were finalized. The review consisted of the assigned Project participants conducting an evaluation of the ESF design for compliance with assigned regulations from the checklist of applicable 10 CFR 60 regulations and documenting

the results on the supplied form according to the review procedure. For more details (including the checklist, the appropriate form and the review procedure), see the minutes of the two workshops Enclosures A and B of the Regulatory Compliance Review Exercise Documentation Package included in this Review Record Memorandum, Section 7.0, Volume 2, "10 CFR 60 Compliance Review".

The reviewing organizations determined that the ESF design complied with 15 of the 20 applicable 10 CFR 60 regulations. Note that an additional evaluation (of 10 CFR 60 - General Comment) was completed during the review. In all cases where the reviewers determined the design was not in compliance with the regulations, a comment was submitted to the proper Architect/Engineer (A/E). Listed below are the regulations to which the reviewers felt the ESF design was not in compliance and the number of the comment made by the reviewer to the A/E addressing this non-compliance:

| | |
|--|---|
| 10 CFR 60 - General Comment | Comment No. S.MI.RES.004 |
| 10 CFR 60.75 - NRC Office Space | Comment No. T.AR.JMD.003 |
| 10 CFR 60.113(a)(1) -Postclosure System | Performance by Engineered Barrier Comment No. L.MI.DGW.018 |
| 10 CFR 60.133(b) -Flexibility of Design of Underground Facilities | Comment No. S.GE.TEB.001 |
| 10 CFR60 -Subpart F -Performance Confirmation Program | Comment No. S.MI.RES.004 |

All comments submitted to the A/Es as a result of this exercise were dispositioned satisfactorily to both the reviewer and the A/E, indicating that the reviewer believed the design either complied with the regulation or would comply with the regulation once the agreed-upon action had been completed.

In two of the cases (10 CFR 60.113(a) and 10 CFR 60.133(b), the A/E agreed with the reviewer and committed to the action proposed by the reviewer to bring the design into compliance. Concerning the NRC office space, the A/E stated that office space that complied with the regulations would be located in the A&E Building. The A/E disagreed with the reviewer's conclusion of non-conformance of the design with 10 CFR 60 -Subpart F regulations and with the 10 CFR 60 -General Comment (which concerned testing flexibility). A resolution between the reviewer and the A/E was reached during the comment disposition phase of the TAR.

There was one case (10 CFR 60.72) in which the reviewer could draw no conclusion of compliance. The reviewer felt that compliance with this regulation could not be determined until later in the design. The reviewer did state that: "There is nothing in the current design that appears to preclude the proper collection of the required records."

Please note that all review forms completed during this exercise are included as Enclosure C of the Regulatory Compliance Review Exercise Documentation Package, included in this Review Record Memorandum, Section 7.0, Volume 2, "10 CFR 60 Compliance Review".

Additionally, there were several areas to which reviewers outside of the above exercise addressed comments. These were design flexibility, testing, and seals. All of these comments were also dispositioned to the satisfaction of the reviewer by the A/E.

Some of the NRC concerns were addressed as part of the TAR. Many of the ones not addressed cover Project positions (e.g. shaft locations, shaft spacing, testing in ES-2) that are dictated to the A/Es through baselined design requirements documents such as the SDRD and the RIB. These documents were not subject to review during the 100% Title I TAR. These concerns will be addressed by other means and any resulting changes in Project positions will be handed down to the A/Es in the form of changes to these documents. The incorporation of these changes into the ESF design will then be within the scope of subsequent reviews.

Although some concerns exist over the regulatory compliance of the Exploratory Shaft Facility, no issues have been identified at this point that could impact future licensing. As the design matures during Title II, special attention will be paid to these concerns to ensure the design complies with applicable 10 CFR 60 regulations and has no negative impacts on eventual repository licensing.

10. Have the drawings and/or specifications received adequate checking?

o Civil, Architectural, and Architectural/Structural

A review of the H&N Civil, Architectural, and Architectural/Structural drawings and specifications revealed 17 checking errors.

o Mining/Shaft/Ventilation and Civil

Minor discrepancies which could be prevented with more careful checking exist within the drawings. Examples are F&S Mining Comment 41, Section B-B not consistent with Section A-A; Mining Comment 54, symbols inconsistent; Mining Comment 59, Section E-E inconsistent with other views, Mining Comment 84, duplication of paragraphs in specification. F&S agreed to correct the discrepancies.

o Geotechnical/Testing

A review of the drawings and specifications still revealed a number of checking errors. The following types of errors were noted:

- Spelling
- Incorrect or confusing symbols
- Incomplete or incorrect cross-references between drawings
- Inconsistency of details on different drawings or views

Both A/Es stated that detailed checking was not performed prior to the review due to lack of time and manpower. They intended to perform their own detailed checking concurrently with the technical assessment review. All inconsistencies and drafting errors would be corrected prior to the final Title I submittal.

It would be much better if the A/Es did their detailed checking and made corrections prior to submittal for the Technical Assessment Review.

There was improvement in a related area, that of legibility of lettering and symbols when reduced to half size. Such comments were made at the 50 percent Title I review. At this review, no such comments were made relative to F&S drawings. H&N drawings were, in general, improved, but lettering was still not as legible or clear as it could be on some drawings. H&N agreed to further correct this problem during Title II.

- o Mechanical

The F&S drawings have been signed off for checking approval. The H&N drawings have not been signed off for checking approval. However, both the F&S and H&N drawings contain numerous drafting errors and discrepancies. Examples of these problems are addressed by H&N comments ME-005, ME-027, ME-057, and AR-020 and F&S comments PI-002, PI-020, SH-101, SH-111, CI-001, CI-040, CI-046, and CI-048.

The A/Es have agreed to correct these errors/discrepancies.

- o Electrical

The electrical drawings have no major errors. The electrical specifications which were available in outline form, or very abbreviated form for Title I design, were sufficient.

- o Repository/Operations

A review of the drawings and specifications revealed only minor problems with checking and of those identified, the majority were located in the specifications.

- o Quality Assurance

Comments were made on the inadequacy of checking of drawings by both A/Es. For the F&S drawings Comment No. F.GE.JAJ.007 says in part, "Drawings do not indicate a QA review and acceptance by F&S." For the H&N drawings, Comment F.GE.JAJ.031 states, "There is no evidence on the drawings that a H&N QA review of these drawings has been completed." Comment T.GE.PJK.001 ends with "No drawings have been checked."

11. Have any comments been unresolved or resolutions in dispute?

- o Civil, Architectural, and Architectural/Structural

No H&N Civil, Architectural, or Architectural/Structural comment remain unresolved or resolutions in dispute.

- o Mining/Shaft/Ventilation and Civil

There were no unresolved comments or disputed resolutions in the categories reviewed for F&S Mining, Shaft, Civil and Ventilation.

- o Mechanical

No mechanical-related comments are unresolved or comment resolutions in dispute.

- o Electrical

All electrical comments have been resolved.

- o Repository/Operations

None of the comments submitted at the 100 percent ESF Technical Assessment Review were left unresolved. Final review resolution of all comments is delegated by project procedure to the AE's and so no comments lacked resolution. Three of the comment resolutions as accepted by the AE's are in dispute. The disputed comment resolutions are as follows:

- o General comment GE-010 by M. Fox, Reference: R.GE.MAF.011
- o General comment GE-053 by D. Stucker, Reference: Q.GE.DS.002
- o Civil comment CI-154 by P. Phillips, Reference: N.CI.PEP.028

The process for conclusion of a disputed comment resolution requires the reviewer to present his concerns in writing to the next higher level of project authority for a decision.

- o Regulatory Compliance

All comments submitted to the A/Es addressing licensing concerns or compliance with 10 CFR 60 regulations were resolved during the comment resolution phase of the TAR.

3.0 Comments Disposition and Resolution (including items in dispute process)

COMMENT RESOLUTION ORDER

| | |
|----------------------------|-------------|
| GENERAL-GENERAL | H&N AND F&S |
| GENERAL | H&N |
| GENERAL | F&S |
| CIVIL | H&N |
| ARCHITECTURAL | H&N |
| ARCHITECTURAL/STRUCTURAL | H&N |
| MECHANICAL/FIRE PROTECTION | H&N |
| ELECTRICAL/COMMUNICATIONS | H&N |
| CIVIL | F&S |
| SHAFT | F&S |
| VENTILATION | F&S |
| PIPING & INSTRUMENTATION | F&S |
| ELECTRICAL | F&S |
| MINING <u>MECHANICAL</u> | F&S |

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME:

DOE / HQ

LEAD REPRESENTATIVE:

Dean Tucker

DATE:

9/8/88

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME: YMPD

LEAD REPRESENTATIVE: Robert J. Walter

DATE: September 8, 1988

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME: WESTON

LEAD REPRESENTATIVE: James E. Monte

DATE: 9/2/88

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME: TEMSS

LEAD REPRESENTATIVE: James R. Little

DATE: 9 SEPT 88

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME: SAIC/DA

LEAD REPRESENTATIVE: John Gardini

DATE: 9/9/88

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME:

NSHA

LEAD REPRESENTATIVE:

Redric M. Ireland

DATE:

9/9/88

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME: U.S. Bureau of Mines

LEAD REPRESENTATIVE: Bruce Cantrell

DATE: 9-9-88

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME: U. S. Geological Survey

LEAD REPRESENTATIVE: Robert W. Craig

DATE: Sept. 9, 1988

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME: SANDIA NATIONAL LABORATORIES

LEAD REPRESENTATIVE: Robert E. Stinebaugh

DATE: 9/8/88

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME: Lawrence Livermore National Lab.

LEAD REPRESENTATIVE: Dale G. Wilder

DATE: 9/8/88

✓
ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME: Los Alamos

LEAD REPRESENTATIVE: Thomas J. Mason

DATE: September 9, 1988

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME: DOE/NTSO

LEAD REPRESENTATIVE: Andrew R. Veloso

DATE: 9/9/88

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES, EXCEPT FOR THE FOLLOWING COMMENTS:

H&N GENERAL GE-006 R.GE. MAF.010
H&N GENERAL GE-007 R.GE. MAF.015
F&S GENERAL GE-010 R.GE. MAF.011

CONCERNING PLACEMENT OF QA LEVEL AND QALC REFERENCES ON DRAWINGS IS IN THE DISPUTE PROCESS,

IT IS THE REVIEWER'S RESPONSIBILITY TO CONTINUE THE DISPUTE PROCESS WITH THEIR MANAGEMENT AND THE YUCCA MOUNTAIN PROJECT OFFICE.

ORGANIZATION NAME: REEC.

LEAD REPRESENTATIVE: DANIEL L. KOSS

DATE: SEPT 09, 1988

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES, EXCEPT FOR THE FOLLOWING COMMENTS: *NONE*

IT IS THE REVIEWER'S RESPONSIBILITY TO CONTINUE THE DISPUTE PROCESS WITH THEIR MANAGEMENT AND THE YUCCA MOUNTAIN PROJECT OFFICE.

ORGANIZATION NAME: *U.S. ARMY, CORPS OF ENGINEERS*
LEAD REPRESENTATIVE: *Link O. Jensen*
DATE: *16 SEP 1988*

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES, EXCEPT FOR THE FOLLOWING COMMENTS:

H & N Civil 154, N-CI-PEP-087, concerning looping the fire main, is in the dispute process.

IT IS THE REVIEWER'S RESPONSIBILITY TO CONTINUE THE DISPUTE PROCESS WITH THEIR MANAGEMENT AND THE YUCCA MOUNTAIN PROJECT OFFICE.

ORGANIZATION NAME: DOE-NV Safety & Health Division
LEAD REPRESENTATIVE: Robert E. Phillips
DATE: September 9, 1988

ESF TITLE I 100% TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

THE REVIEW TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE DESIGN COMMENT AND RESOLUTION ACTIVITIES, EXCEPT FOR THE FOLLOWING COMMENTS:

IT IS THE REVIEWER'S RESPONSIBILITY TO CONTINUE THE DISPUTE PROCESS WITH THEIR MANAGEMENT AND THE YUCCA MOUNTAIN PROJECT OFFICE.

ORGANIZATION NAME: DOE/NV ISD
LEAD REPRESENTATIVE: D D Bryan
DATE: 9/23/88

COMMENT RESOLUTION SHEET

Page 1

NES0101
7/88

Document Originator H&N AND F&S

Date 8/8/88

Document Title ESF 100% Technical Review

Title I

General

Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson [Signature] Date 9/15/88

QA [Signature] Date 9/15/88

A/E [Signature] Date 9/15/88

WMPO [Signature] Date 9/16/88

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

NOTES:

- See Page 2 for start of comments.
- All of Dean Stucker's comments submitted as General* comments 1 through 9 have been renumbered General 52 through 60 respectively. Comment statement, agreed to resolution, and reviewer unique comment identification remains unchanged, as shown in example below:

EXAMPLE: WAS CONDITION

1. GENERAL

I have reviewed all of our organizations ESF Title I-50% Design Review comments and they have been incorporated to my satisfaction; except for those which have been restated herein.

.....

Q.GE.DS.001*

IS CONDITION

52. GENERAL

I have reviewed all of our organizations ESF Title I-50% Design Review comments and they have been incorporated to my satisfaction; except for those which have been restated herein.

.....

Q.GE.DS.001*

No comment. (F&S)

No H&N resolution required. (H&N)

No comment. (F&S)

No H&N resolution required. (H&N)

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 2

Name of Reviewer General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------|---|---|
| 1 | GENERAL | <p>As lead reviewer for Los Alamos, I have reviewed all of our organizations' ESF Title I 50% Design Review comments and they have been incorporated to my satisfaction (consistent with the resolution agreed to) except as shown below or as appears in a new comment.</p> <p>Exception: A.I.P.A.014 (Inconsistent wording on test detail drawings). A.GE.TJM.017</p> | <p>No H&N resolution required. (H&N)</p> <p>Agree. Will change "Excavation Effects Test" to "Intact Fracture Test" in two places, A-7, A-5 on FS-GA-0163. (F&S)</p> |
| 2 | GENERAL | <p>I have reviewed all of the ESF Title I 50 Percent Design Review comments and they have been incorporated to my satisfaction, except for:</p> <p>E. G. AV.001</p> <p>E.GE.ARV.005</p> | <p>No H&N resolution required. (H&N)</p> <p>Agree. Valve symbols not complying with ISA standards will be corrected. (F&S)</p> |
| 3 | GENERAL | <p>The approved resolutions to the T&MSS comments submitted at the 50 Percent ESF Title I Design Review have been satisfactorily incorporated into the ESF Title I Design at 100 Percent or the comments have been restated herein.</p> | <p>No H&N resolution required. (H&N)</p> <p>No comment. (F&S)</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer General

Page 3

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | T.GE.SWP.001 | |
| 4 | | GENERAL All comments from Title I 50 Percent Review were resolved except for 6 comments which were restated. | No H&N resolution required. (H&N) No comment. (F&S) |
| | | T.GE.THP.039 | |
| 5 | | GENERAL Except as noted herein, the rest of my comments from the 50% review have been incorporated to my satisfaction. | No H&N resolution required. (H&N) No comment. (F&S) |
| | | T.GE.ALL.004 | |
| 6 | | GENERAL I have reviewed all of the REECO ESF Title I 50 Percent Design Review comments and they have been incorporated to my satisfaction, except for: | No H&N resolution required. (H&N) No comment. (F&S) |
| | | R.F.WG.001 R.F.WG.004 R.F.WG.005 R.I.WG.022 R.I.WG.027 R.I.WG.028 R.I.WG.039 R.I.WG.040 R.C.DK.005 R.C.DK.037 R.A.DK.048 R.A.DK.039 R.F.DK.056 | |
| | | These comments have been repeated or restated herein. | |
| | | R.GE.DLK.033 | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer General

Page 4

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|---------|---|---|
| 7 | GENERAL | I have reviewed all of our organizations ESF Title I 50% Design Review Comments and they have been incorporated to my satisfaction, except for as shown below: None. C.GE.EOJ.033 | No H&N resolution required. (H&N) No comment. (F&S) |
| 8 | GENERAL | Note: My ESF 50 Percent Title I Design Review Comments have been incorporated or have been restated herein. T.GE.IRC.020 | No H&N resolution required. (H&N) No comment. (F&S) |
| 9 | GENERAL | All accepted comments from the 50 Percent Title I Design Review have been accommodated except for G.I.BG.006, G.F.BG.009, G.I.BG.013, G.I.BG.014, and G.I.BG.015. G.GE.RWC.001 | No H&N resolution required. (H&N) Agree. These comments are addressed elsewhere. (F&S) |
| 10 | GENERAL | The approved resolutions to the T&MSS comments submitted at the 50 Percent Title I Design Review have been satisfactorily incorporated into the | No H&N resolution required. (H&N) H&N Drawing. (F&S) |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer General

Page 5

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|--|
| | | <p>ESF Title I Design at 100 Percent Completion with the following exceptions: T.F.SS.006, T.F.SS.015, T.F.SS.032, which are repeated below. T.GE.SCS.001</p> | |
| 11 | | <p>GENERAL With the exception of the following, all review comments made at the ESF Title I 50 Percent Design Review have been incorporated in a satisfactory manner: G.F.TL.006, G.F.TL.008, G.F.TL.015, and G.F.TL.016. G.GE.TLL.001</p> | <p>No H&N resolution required. (H&N) Agree. Comments will be incorporated. (F&S)</p> |
| 12 | | <p>GENERAL I accept all resolution of 50% Review comments, unless otherwise noted. L.GE.DGW.019</p> | <p>No H&N resolution required. (H&N) No comment. (F&S)</p> |
| 13 | | <p>GENERAL All 50 Percent Review comment resolutions have been incorporated. T.GE.JHM.004</p> | <p>No H&N resolution required. (H&N) No comment. (F&S)</p> |
| 14 | | <p>GENERAL The 100% Title I Design has adequately incorporated the resolution to my comments on the 50% Title I Design.</p> | <p>No H&N resolution required. (H&N) No comment. (F&S)</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 6

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------|--|---|
| | | T.GE.JMD.001 | |
| 15 | GENERAL | The approved resolutions to the T&MSS/SAIC comments submitted at the 50 percent ESF Title I Design Review have been satisfactorily incorporated into the ESF Title I Design at 100 percent completion. | No H&N resolution required. (H&N) No comment. (F&S) |
| | | T.GE.RLT.001 | |
| 16 | GENERAL | GENERAL From 50 Percent Review the following comments have been fully addressed except as repeated herein: | No H&N resolution required. (H&N) No comment. (F&S) |
| | | R.GE.WHG.001 | |
| 17 | GENERAL | With the exception of the above comments, all resolutions from the 50% review were adequately incorporated into the design. | No H&N resolution required. (H&N) No comment. (F&S) |
| | | T.GE.EMC.006 | |
| 18 | GENERAL | The following H&N drawings do not conform (not compatible) to the NTS drawing note requirements described in | Will be incorporated in Title II. (H&N) H&N comment. (F&S) |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer General

Page 7

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|------------|
| | | <p>the DOE directive, issued by the DOE/NTSO Director to all NTS contractors, NTSO:ON-233 dated 7/13/88 (attached), which states, in part, "Requirements shall be defined by citing individual sections, paragraphs or sentences of the selected code, standard..."</p> | |
| | | JS-025-ESF-A1.A - Note #3 - AISC, AWS | |
| | | JS-025-ESF-A1.A - Note #7 - U.S.C. | |
| | | JS-025-ESF-E1.A - Note #4 - NEC, ANSI | |
| | | JS-025-ESF-FP5.B Note #5 - NFPA | |
| | | JS-025-ESF-FP6.B Note #5 - NFPA | |
| | | JS-025-ESF-FP7.B Note #5 - NFPA | |
| | | JS-025-ESF-FP8.B Note #5 - NFPA | |
| | | JS-025-ESF-FP9.B Note #5 - NFPA | |
| | | JS-025-ESF-FP10.B Note #5 - NFPA | |
| | | JS-025-ESF-FP11.B Note #5 - NFPA | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer General

Page 8

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------------|----------|---------------------|------------|
| JS-025-ESF-FP12.B | Note #5 | - NFPA | |
| JS-025-ESF-FP13.B | Note #5 | - NFPA | |
| JS-025-6000-A1.B | Note #9 | - ACI | |
| JS-025-6000-A1.B | Note #10 | - ASTM | |
| JS-025-6000-A1.B | Note #11 | - ASTM | |
| JS-025-6000-E2.B | Note #3 | - NEC | |
| JS-025-6001-A1.B | Note #9 | - ACI | |
| JS-025-6001-A1.B | Note #11 | - ASTM | |
| JS-025-6001-A2.A | Note #1 | - AWS, UBC | |
| JS-025-6001-A2.A | Note #7 | - UBC | |
| JS-025-6001-E1.B | Note #3 | - NEC | |
| JS-025-6002-A1.A | Note #1 | - AISC, UBC | |
| JS-025-6002-E3.B | Note #3 | - NEC | |
| JS-025-6004-A1.B | Note #4 | - UBC | |
| JS-025-6004-E1.B | Note #2 | - NEC, ANSI | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer General

Page 9

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------|---|---|
| | | JS-025-6006-A1.B Note #2 - AWS, UBC | |
| | | JS-025-6006-E1.B Note #2 - NEC | |
| | | JS-025-6007-A1.B Note #2 - AWS | |
| | | JS-025-6007-A1.B Note #3 - UBC | |
| | | JS-025-6007-E1.B Note #3 - NEC | |
| | | JS-025-6008-A1.A Note #2 - AISC, UBC | |
| | | JS-025-6008-E1.B Note #2 - NEC | |
| | | JS-025-058-1-E1.B Note #2 - NEC | |
| | | JS-025-058-2-E1.B Note #3 - NEC | |
| | | E.GE.ARV.002 | |
| 19 | GENERAL | On the H&N drawings, it would be easy to find a drawing if the drawings were consecutively numbered as with the F&S drawings. | The drawings will be reordered and numbered for 30% Title II. (H&N) H&N comment. (F&S) |
| | | M.GE.JW.001 | |
| 20 | GENERAL | Include a description of requirements for the control of processes (such as | Will be a part of the Title II specifications. (H&N) |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 10

Name of Reviewer General

COMMENT REVIEWER'S COMMENTS
NO. PAGE

RESOLUTION

installation) for QA Level I items under
the heading "Quality Assurance".

F.GE.JAJ.028

21 GENERAL

Although the present version of the RIB
may be adequate for a Title I design,
it has not been adequately reviewed to
assure the NRC that we are using the
best available data to design the ESF
to meet the requirements in the 10 CFR
60. Sandia has been conducting
reviews of data for inclusion into an
updated version of the RIB that may
have the pedigree to satisfy NRC
concerns. Submission of that version
is scheduled for September. DOE/WMP
and SAIC must ensure that procedures for
reviewing the RIB and baselining it as
a project document are in place.
Without significant management
pressure, this may not occur. Delay in
a project baselined version of the RIB
will have a profound effect on a Title
II schedule.

S.GE.TEB.002

Title II Specifications will include the
appropriate description for all QA levels.
(F&S)

Agree, no H&N resolution required. (H&N)

No comment. (F&S)

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer General

Page 11

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------|--|--|
| 22 | GENERAL | <p>In future Technical Assessment Reviews of the ESF, the review for compliance to 10 CFR 60 requirements should be fully integrated into the review. This will require that participants be assigned by DOE/WMPO the responsibility for determining (a primary function, not a review function) whether the ESF design meets each of the applicable regulations. The responsible organizations should then provide their findings as part of the presentations and documents to be reviewed during the design review. Other project participants who are not responsible for evaluating whether a particular regulation is met by the design should be assigned to review this work.</p> <p style="text-align: right;">S.GE.TEB.003</p> | <p>Agree, no H&N resolution required. (H&N)</p> <p>No comment. (F&S)</p> |
| 23 | GENERAL | <p>The SDRD Appendix E currently identifies OSHA, MSHA, State of California, and State of Nevada mining regulations as applicable to the design and construction of the ESF underground facility. It is unclear as to who is</p> | <p>H&N will assess a mechanism to document that applicable codes are being used. (H&N)</p> <p>This may require a memorandum of understanding between DOE (Project Office) and the regulatory agencies. (F&S)</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer General

Page 12

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------|--|---|
| | | <p>responsible for the interpretation and implementation of these regulations. Without this knowledge it is difficult for the A/E to make a judgment on the applicability of certain sections of the regulations (e.g., ladderways in shafts). The enforcing agencies need to be identified and should interface with the A/E to provide guidance on the applicability of the regulations.</p> <p style="text-align: right;">K.GE.DW.015</p> | |
| 24 | GENERAL | <p>The A/Es should prepare a checklist system to periodically review design requirements in DOE Orders, mining codes and other requirements documents. This checklist must be revisited on a regular basis to see that new impacts are picked up as they occur.</p> <p style="text-align: right;">K.GE.JEM.001</p> | <p>H&N will assess a mechanism to document that applicable codes are being used. (H&N)</p> <p>Agree. This is also a part of the basis for design (BFD). (F&S)</p> |
| 25 | GENERAL | <p>ES-1 and ES-2 shafts will require a operating permit for air pollution. Show dust control methods for headframes and shafts.</p> <p style="text-align: right;">T.GE.THP.030</p> | <p>No H&N resolution required. (H&N)</p> <p>Dust control is accomplished at the source (present design). Shaft air effluent will not exceed applicable standards. (F&S)</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer General

Page 13

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------|--|---|
| 26 | GENERAL | <p>The Life Safety/Fire Protection subcommittee met several times since the prior drawing review. This subcommittee generated a total of 30 recommendations that are documented in H&N transmittals dated July 1, 1988, and July 5, 1988. There is a minority report on Item #4 (SHD to L.P. Skousen 7/11/88) that must be resolved by Dennis Irby. These recommendations are not detailed in the H&N or F&S Title I drawings, but need to be in Title II.</p> <p>N.GE.PEP.059</p> | <p>Agree, will be considered in Title II. (H&N)</p> <p>Agree. These recommendations were appropriately excluded from Title I. Project Office approval is required before incorporating recommendations as design inputs; these recommendations will be considered and incorporated after Project Office approval. (F&S)</p> |
| 27 | GENERAL | <p>It is recommended that all previous fire protection recommendations, which were made by the ESF-Life Safety/Fire Protection Subcommittee and not included in these drawings, be incorporated in the Title II drawings. These recommendations are listed in H&N Conference Report CR: 88-033, dated June 20, 1988 (draft), and H&N Conference Report CR: 88-038, dated July 1, 1988.</p> <p>R.GE.JLB.014</p> | <p>Agree, will be considered in Title II. (H&N)</p> <p>Agree. These recommendations were appropriately excluded from Title I; Project Office approval is required before incorporating recommendations as design inputs; these recommendations will be considered and incorporated after Project Office approval. (F&S)</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer General

Page 14

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------|---|---|
| 28 | GENERAL | DOE Orders 6430.1A and 5480.1B will apply. N.GE.PEP.110 | Agree. (H&N) No comment. (F&S) |
| 29 | GENERAL | The National Electrical Code will apply. N.GE.PEP.111 | Agree. (H&N) No comment. (F&S) |
| 30 | GENERAL | All equipment should be UL or FM listed with label, for the purpose used. N.GE.PEP.112 | Agree, where applicable. (H&N) Agree. UL or FM labeled equipment will be used where appropriate. (F&S) |
| 31 | GENERAL | Mueller hydrants are the NTS Standard and are usually government furnished. Wet-barrel hydrants cannot be used because they will freeze. N.GE.PEP.115 | Agree, but brand names may not be listed. (H&N) No comment. (F&S) |
| 32 | GENERAL | The use of brand names identifies the quality of the product. If you specify a Cadillac Brougham, you should not accept a Ford. N.GE.PEP.116 | Brand names, when used, will be stated "or equal" with determination by the A/E. (H&N) Government regulations do not permit specification by brand name. Salient features will be incorporated in the specifications to define the quality. (F&S) |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer General

Page 15

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|---------|---|---|
| 33 | GENERAL | Transformer installations must also meet FM Loss Data Sheet 5-4 (Required by 6430.1A Page 1-29 and Page 16-8, Paragraph 1630-2.3.5). N.GE.PEP.117 | Agree. (H&N) H&N comment pertains to oil filled transformers. (F&S) |
| 34 | GENERAL | Access ladders are required in both shafts. N.GE.PEP.118 | No H&N resolution required. (H&N) Not required by SDRD. An alternative egress is afforded by the escape hoist. (F&S) |
| 35 | GENERAL | Ref. 30 CFR 75.300-2 (c) (i) Main surface fans should have a separate power circuit independent of any other mine circuit. M.GE.JW.005 | Disagree, This is a coal mine standard and is not applicable to the ESF. (H&N) Disagree. 30 CFR 75 pertains to gassy coal mines. 30 CFR 75 is not applicable to this Project. SDRD requires compliance with 30 CFR 57. (F&S) |
| 36 | GENERAL | Ref. 30 CFR 57.5050 Make the fan manufacturers guarantee that underground fans meet the noise requirements (i.e. less than 90 dBA). M.GE.JW.006 | No H&N resolution required. (H&N) Agree. (F&S) |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 16

Name of Reviewer General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------------|---|---|
| 37 GENERAL | Ref. 30 CFR 57.5003 | Make the drill manufacturers guarantee that all dry drilling will meet the dust requirements. M.GE.JW.007 | No H&N resolution required. (H&N) Disagree. Manufacturer cannot guarantee conditions beyond his control, only that his equipment will perform tasks for which it was designed to do. Dust control is an operating responsibility. (F&S) |
| 38 GENERAL | | All F&S specifications do not conform (not compatible) in format and technical content as required by NTS "Guide to Specification Writing", as described and directed in the DOE letter issued by DOE/NTSO Director to all NTS contractors, NTSO: ON-230, dated 5/17/88 (attached). E.GE.ARV.003 | No H&N resolution required. (H&N) Agree that specification is not compatible. However, final determination of the applicability of NTSO directives is to be made by F&S contracting officer and DOE/NV contracting officer, since NTSO is currently involved in the procurement process for NNWSI. (F&S) |
| 39 GENERAL | ALL | All H&N specifications do not conform (not compatible) in format and technical content as required by NTS "Guide to Specification Writing", as described and directed in the DOE letter issued by DOE/NTSO Director to all NTS contractors, NTSO: ON-230, dated 5/17/88 (attached). E.GE.ARV.001 | Will be incorporated in Title II. (H&N) No comment. (F&S) |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer General

Page 17

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------|---|--|
| 40 | GENERAL | <p>SPECIFICATIONS</p> <p>These Specifications should be updated to reflect numerous changes which were made in DOE 6430.1A, "General Design Criteria" (Draft).</p> <p>R.GE.JLB.037</p> | <p>Will provide in Title II. (H&N)</p> <p>Agree. (F&S)</p> |
| 41 | GENERAL | <p>F&S TECHNICAL SPEC.</p> <p>General - All references to "Contract Drawings" should be changed to "Project Drawings" to avoid confusion and multiple changes when the specification applies to work which will be done by both contractor (REECo) and the subcontractor.</p> <p>R.GE.LGC.003</p> | <p>No H&N resolution required. (H&N)</p> <p>Drawings are part of the contract package and they are referred to as construction drawings. (F&S)</p> |
| 42 | GENERAL | <p>H&N DIVISION 15.A</p> <p>A review of the basic outline specifications covering Div. 15, mechanical, has revealed the omission of information covering quality control/inspection in the following documents:</p> <p>SECTION 15140.A, 15190.A, 15242.A, 15260.A, 15440.A, 15450.A, 15480.A, 15781.A, 15782.A, 15785.A, 15870.A, 15875.A, 15880.A, 15885.A, 15890.A,</p> | <p>Will provide in Title II. (H&N)</p> <p>H&N comment. (F&S)</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer General

Page 18

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------|---|--|
| | | <p>15990.A, 05120.A.</p> <p>A section covering quality control/inspection should be added. This comment also applies to the following specs:</p> <p>Section 05210.A, 05300.A, 07200.A, 07465.A, 08800.A, 11180.A, 13121.A, 02211.A, 02222.A, 02500.A, 02556.A, 02614.A, 02720.A</p> <p style="text-align: right;">F.GE.JAJ.023</p> | |
| 43 | GENERAL | <p style="text-align: center;">DIVISION 15 SPECIFICATIONS</p> <p>a. General: Verify that the CSI spec. nos. as used in this contract are the official nos. normally used by CSI, and change as necessary.</p> <p>b. Section 15145: Use the term Electric Space Heater I.L.O. Electric Boiler.</p> <p>c. Sections 15781 and 15782 may be combined due to many commonalities.</p> <p>d. Recommend Sections 15410 and 15440 be combined since subject to same trade.</p> | <p>A. Agree, will verify during Title II.</p> <p>B. Section 15145 will be deleted. Section 15440 will address electric unit heaters.</p> <p>C. Either format should be acceptable.</p> <p>D. Either format should be acceptable.</p> <p>E. Either format should be acceptable. (H&N)</p> <p>H&N comment. (F&S)</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer General

Page 19

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------|---|---|
| | | <p>e. Recommend Sections 15890 and 15910 be combined since subject to same trade. C.GE.EOJ.032</p> | |
| 44 | GENERAL | <p>CALCULATIONS COOLING LOAD Consider the cooling load due to lights be reduced from 3 watts/sf to approximately 1.5-2.0 watts/sf which is a more realistic value for present day efficiency light fixtures. C.GE.EOJ.027</p> | <p>These are preliminary calculations. Calculations to date are not reviewable or commentable documents. (H&N) H&N comment. (F&S)</p> |
| 45 | GENERAL | <p>CALCULATIONS M-000 a. Re-evaluate your hot water demand based on a water heater efficiency of 0.8. b. State the recovery rate for the heaters. c. Be aware that undersizing a hot water system could cause extreme inconvenience. C.GE.EOJ.029</p> | <p>See comment #44 or C.GE.EOJ.027. (H&N) H&N comment. (F&S)</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

Page 20

Name of Reviewer

General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|---------|--|--|
| 46 | GENERAL | CALCULATIONS M-0001 Verify and state criteria source for the ventilation rate. 1/2 AC/HR appears inadequate. C.GE.EOJ.031 | See comment #44 or C.GE.EOJ.027. (H&N) H&N comment. (F&S) |
| 47 | GENERAL | CALCULATIONS M-0003 For the welding exhaust system, provide calcs. for the capture velocity, and verify that it satisfies the Department of Industrial Hygiene's requirements. C.GE.EOJ.030 | See comment #44 or C.GE.EOJ.027. (H&N) H&N comment. (F&S) |
| 48 | GENERAL | CALCULATIONS PLUMBING In all buildings that have flush valve type water closets the domestic cold water requirement shall be 10 FU I.L.O. 35 (20 FU some locations). Reference: UPC, 1988 edition, (Appendix A, Table A-2, Page 137). C.GE.EOJ.028 | See comment #44 or C.GE.EOJ.027. (H&N) H&N comment. (F&S) |
| 49 | GENERAL | FP CALCULATIONS Draw the system curve for all buildings with a water sprinkler system and show that your demand point (gpm vs resid. pressure) is on or below this curve. C.GE.EOJ.025 | See comment #44 or C.GE.EOJ.027. (H&N) H&N comment. (F&S) |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer General

Page 21

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS |
|----------------|------|---------------------|
|----------------|------|---------------------|

| RESOLUTION |
|------------|
|------------|

50 GENERAL FP CALCULATIONS
In all buildings where a fire sprinkler system is to be installed, the designer shall state the basis for layout of the system (i.e., based on pipe schedule, hydraulically calculated system, etc.). If a hydraulically calculated system option is permitted, calcs for such system shall be provided.
C.GE.EOJ.026

See comment #44 or C.GE.EOJ.027. (H&N)
H&N comment. (F&S)

51 GENERAL
As presently planned, the ESF will not necessarily meet 10 CFR 60.133 (b), flexibility of design. This regulation requires that, "The underground facility shall be designed with sufficient flexibility to allow adjustments where necessary to accommodate specific site conditions identified through in situ monitoring, testing, or excavation". The information from existing coreholes is insufficient to locate, with confidence, the long exploratory drifts in the ESF. Present plans include these drifts as future repository drifts. Sandia's IGIS system has been used to project the stratigraphy along the

No H&N resolution required. (H&N)
Agree. When new data is made available the design will be appropriately reviewed and/or revised. (F&S)

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer General

Page 22

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS |
|----------------|------|---------------------|
|----------------|------|---------------------|

| RESOLUTION |
|------------|
|------------|

direction of these drifts, but recent sensitivity studies (presentation by R.E. Stinebaugh and M. Fowler to the ESF-ICWG on May 3, 1988) have demonstrated that a reinterpretation of existing coreholes would significantly change the projection of stratigraphy in some areas. Additional coreholes near the northeastern part of the repository are required to assure that the stratigraphy along the direction of the long drifts is projected with confidence. Only then can the long drifts be located with assurance that they meet "specific site conditions".

Until new corehole data is available, drawings that show underground elevations and slopes (e.g. FS-GA-0195 to 0199) should contain a note that elevations and slopes are preliminary pending new corehole data. More importantly, the schedule for the integrated drilling plan must include timely completion of appropriate coreholes.

S.GE.TEB.001

COMMENT RESOLUTION CONTINUATION SHEET

Page 23

NES0102
7-88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
GENERAL *

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS |
|----------------|------|---------------------|
|----------------|------|---------------------|

| RESOLUTION |
|------------|
|------------|

52. GENERAL

I have reviewed all of our organizations ESF Title I-50% Design Review comments and they have been incorporated to my satisfaction; except for those which have been restated herein.

..... Q.GE.DS.001*

No comment. (F&S)

No H&N resolution required. (H&N)

53. GENERAL

Comment #1 from the 50% Design Review, "The seismic design factors referenced from the SDRD assume that the permanent items specified in the GR Appendix E (specifically, the liner) are not important to safety or a Category IV as identified in UCRL-15910. The analysis and rationale that the A/E conducted to determine this is not available; therefore, the GR Appendix E, 6.0, pc 2, 3-a, 6-b, and constraint H, and J do not appear to be incorporated in the design. Q.G.DS.001", has not been addressed in the 100% Design as agreed.

..... Q.GE.DS.002*

Disagree. A Title I study has been prepared (FS-ST-0053) and is available to address these concerns. This is a preliminary report and will be expanded during Title II. No fatal flaws to the design can be recognized from seismic impacts due to the results of this study. (F&S)

No H&N resolution required. (H&N)

COMMENT RESOLUTION CONTINUATION SHEET

Page 24

NES0102
7-88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
GENERAL *

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| 54. GENERAL | | <p>Comment 6 of the 50% Design Review: "The design appears to assume that for emergency hoisting, the portable hoist at the NTS will be available. This may not be the case if it is already in use. The design must incorporate an emergency system that is 100% available, therefore, suggest utilizing the 400 hp hoist already purchased and reconditioned as the emergency hoist. Q.C.DS.005", appears to not have been complied with as agreed.</p> <p>. Q.GE.DS.003 *</p> | <p>Disagree, a new truck mounted emergency hoist with torpedo cage will be purchased which is solely dedicated to serve ES-1 and ES-2 during sinking and operational phase. Additionally, during the sinking phase the bucket and the galloway provide alternate means of emergency egress. (F&S)</p> <p>No H&N resolution required. (H&N)</p> |
| 55. GENERAL | | <p>Comment 9 of the 50% Design Review restated, "Appendix E, 6.10, Constraint A requires that the ESF and repository design be integrated to ensure decommissioning and close requirements are consistent. Repository design currently shows location for seals, yet the ESF design does not. It, therefore, appears that this requirement has not been complied with. I suggest identifying the postclosure seal location now, and assuring that there are accommodations for allowing future installation (example, there is a 50' distance from ES-2 to the repository drift. Is this enough space</p> | <p>Disagree, nothing has been done in the ESF design that precludes closure and sealing. SNL is doing detailed sealing and closure studies at this time and F&S is tracking this work to assure that our design presents no problems. Locating the seals prior to completion of the sealing and decommissions studies is considered premature. A Title I study by F&S on decommissions and closure (FS-ST-0055) is available. F&S will attempt to identify potential closure seal areas in coordination with the latest available design information on seal structures (approved or assumed) by 90% Title II. (F&S)</p> <p>No H&N resolution required. (H&N)</p> |

COMMENT RESOLUTION CONTINUATION SHEET

Page 25

NES0102
7-88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
GENERAL *

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------|---|---|
| | | <p>to construct the postclosure seal realizing 20' to 25' feet of this distance in shaft station area). Q.G.DS.008"</p> <p>..... Q.GE.DS.004*</p> | |
| 56. | GENERAL | <p>The design of ES-2 does not identify a ladderway. The State of Nevada Chapter 512 of Nevada Revised Statutes, effective July 1, 1985, Part 1, Title 46, 11-b requires: "all main shafts or raises equipped with hoisting machinery must have one compartment set aside for a ladderway."</p> <p>Appendix E of the GRD identifies that the Function of ES-1 and ES-2 are the same except that ES-2 additionally is to provide for the primary emergency egress. With this in mind, it would appear that both ES-1 and ES-2 are main shafts equipped with hoisting capabilities.</p> <p>In addition, Appendix E, 6.0 Constraint B states: "Applicability of State and local regulation will be determined in consultation with State and local officials as stated in the final EA's Mission Plan NWPA." It appears that State officials have not been contacted to determine if they agree with the</p> | <p>The SDRD states that ES-1 will have a ladderway and is designated as a main shaft for that purpose. The ESF A/E has just completed the preliminary design in compliance with the SDRD.</p> <p>Based on the SDRD, the shafts are different in their applications for the ESF.</p> <p>The A/E has not consulted with the state and local agencies as this is not a work scope item and is considered a client responsibility.</p> <p>Redundant escape/egress options are included in the present design and are considered to be in excess of the requirements. (F&S)</p> <p>No H&N resolution required. (H&N)</p> |

COMMENT RESOLUTION CONTINUATION SHEET

Page 26

NES0102
7-88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
GENERAL *

**COMMENT
NO.**

PAGE

REVIEWER'S COMMENTS

RESOLUTION

current interpretation.

California Administrative Code, Title 8, Chapter 4, Subchapters 17 and 20, is required by DOE Order 5480.4 and the SDRD as applicable design requirements. Section 7044, manways and ladder installations, j & l on page 650.10 state:

"(j) In all shafts which are in the process of sinking or enlarging, a fixed ladder, stair, or ramp shall be provided to within such distance from the bottom of the shaft as will secure it from the danger of blasting."

"(l) Every shaft shall be provided with a continuous means of egress from the bottom of such shaft to the nearest active mine level. Such means of egress may be by stairs or fixed ladders or ramps, or by a combination of the above."

Additionally, Section 8496, (1), page 684.40, states "there shall be two sole means of access in shafts at all times. This may include the ladder and hoist." (Current concepts show the use of a portable hoist. It appears that this hoist may not be available at all times.).

During the sinking phase, the stage is provided with an access ladder for each level. Access from the sinking stage to the bottom of shaft is accomplished using the sinking bucket or lowering the stage close to the shaft bottom. Chain ladder will be attached underneath the stage.

Fixed access ladders with landings spaced at 20 ft. intervals are provided from bottom of shaft to the Main Test Level for ES-1 and ES-2.

The truck mount emergency hoist will be used as the second egress to the shaft in case of emergency. It complies with SDRD.

During construction the bucket and galloway provide alternate means of emergency egress. (F&S)

COMMENT RESOLUTION CONTINUATION SHEET

Page 27

NES0102
7-88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
GENERAL *

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS |
|----------------|------|---------------------|
|----------------|------|---------------------|

| RESOLUTION |
|------------|
|------------|

It appears the design is, therefore, out of compliance with existing baseline requirements for ladderways in ES-2. Additionally, the stated function of the ES-2 shafts in the GRD include "provide for testing in the shaft", it would appear that a ladderway similar to the one in ES-1 would better support testing and mapping in ES-2. I, therefore, suggest that the design be adjusted to accommodate a ladderway in the Title I drawings.
..... Q.GE.DS.005*

57. GENERAL

The current general arrangement drawings show a refuge chamber 51' long by 21' wide. This appears to be small to accommodate the 135 personnel currently expected underground. I suggest enlarging to accommodate personnel and appropriate provisions, requirements and include space for expansion of additional personnel if needed, because of flexibility provisions.
..... Q.GE.DS.006*

58. GENERAL

The current general arrangement drawings as baselined by the interface control drawing R07040A

At the present time no testing in the ES-2 shaft is anticipated at 100% Title I and the design complies with the requirements stated in the SDRD. (F&S)

Title II design will consider most recent population studies for refuge chamber sizing. Analysis will include developed criteria for sizing. (F&S)

No H&N resolution required. (H&N)

Design for the considerations mentioned are adequate at this time. As more detail, better parameters and criteria become available it will be appropriately reflected in the design. (F&S)

COMMENT RESOLUTION CONTINUATION SHEET

Page 28

NES0102
7-88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
GENERAL *

**COMMENT
NO.**

PAGE

REVIEWER'S COMMENTS

RESOLUTION

do not appear to take into account space for operational considerations. Examples of this are lunch rooms, restrooms, supervision office space, equipment parking, adequate space for shop and underground warehouse storage. Considering there will be approximately 135 personnel per shift, and approximately 10 separate vehicles underground, I suggest that the A/E reconfigure the general arrangement to accommodate these considerations with adequate flexibility.

..... Q.GE.DS.007 *

59. GENERAL

The general arrangement drawing depicts three drifts intersecting the future repository drift. It appears that if the general arrangement of the central core area should be rearranged to have only one drift intersecting the repository drift, future postclosure seal concerns would be minimized. I, therefore, suggest that this be reviewed with current conceptual seal requirements and the ESF central core area be modified to accommodate only one drift connecting to future repository drifts.

..... Q.GE. DS.008*

ECRs will be submitted to cover these considerations by 30% of Title II. (F&S)

No H&N resolutions required. (H&N)

Disagree. There are no current requirements to minimize drifts to future repository drifts. SNL has reviewed the ESF design and has no comments in this area. (F&S)

No H&N resolution required. (H&N)

COMMENT RESOLUTION CONTINUATION SHEET

Page 29

NE90102
7-88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
GENERAL *

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|---|
| 60. GENERAL | | <p>The GRD Appendix E, Section 6.0 Constraint M, requires:</p> <p>The ESF shall be designed to include onsite facilities and services that ensure a safe and timely response to emergency conditions and that facilitate the use of available offsite services (such as fire, police, medical, and ambulance service) that may aid in recovery from emergencies.</p> <p>It would appear that an onsite ambulance and fire vehicle, with facilities for storage, are required because of the distance to Mercury and response time if an emergency should develop.</p> <p>..... Q.GE.DS.009*</p> | <p>H&N comment. (F&S)</p> <p>The GRD requirements for on-site emergency facilities and services will be re-evaluated and addressed in the Design Basis Document and for Title II submittal. (H&N)</p> |

COMMENT RESOLUTION SHEET

Page 1

NES0101
7/88

Document Originator F&S

Date 8/8/88

Document Title ESF 100% Technical Review

Title I

General

Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson [Signature] Date 9/15/88

QA [Signature] Date 9/15/88

AE [Signature] for R.L. Bullock Date 9-16-88

WMPO [Signature] Date 9/16/88

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 2

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|--|
| 1 | | <p>GENERAL F&S The following comments were agreed upon at the 50 Percent Title I Review but changes have not been made for the 100 Percent Title I Review:</p> <p>G.G.MW.016 G.I.MW.019 G.GE.MSW.001</p> | <p>Agree. Will make corrections.</p> |
| 2 | | <p>GENERAL F&S J.G. RW.004/GF-026, J.G. RW.003/GF-032, J.G. RW.001/GF-036, J.I. RW.011/I-050, J.I. RW.012/I-051, J.I. RW.013/I-061, J.F. RW.006/F-114, J.F. RW.008/F-126, J.F. RW.010/F-136, J.S. RW.014/S-070, J.S. RW-015/S-076.</p> <p>These comments are all resolved and have been incorporated in the 100 Percent Design/Specification documents. J.GE.RSW.003</p> | <p>No comment.</p> |
| 3 | | <p>GENERAL F&S The agreed resolution to a comment on the 50 Percent Title I design was that the A/E would perform a safety analysis and provide a list of hazards considered during the design process, design alternatives considered, and the</p> | <p>A safety analysis plan is being prepared and will be available prior to completion of Title I. The safety specialist will be "on board" and the safety analyses are scheduled to be completed in Title II. The A/E will provide a list of hazards considered, design alternatives considered, and design features</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 3

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S General

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

principal design, construction and operating features selected for preventing accidents or reducing risks to acceptable levels. A list of hazards has been prepared. Documentation of the safety analysis performed to date still needs to be completed and included as a Title I deliverable. (This comment was identified as T.G. SP.001 and listed as comment number GF-017 in the 50 Percent Design Review Report).

T.GE.SWP.013

4 GENERAL F&S

The agreed resolution to a comment on the 50 Percent Title I design was that the A/E should provide information to support development of the fire protection design analysis defined in DOE Order 5480.7. Additional support in this area for preparation of the Title I Design Summary will be needed. (The relevant comment was identified as T.G. SP.002 and listed as comment No. GF-018 in the 50 Percent Design Review Report).

T.GE.SWP.014

selected for preventing accidents by 30 Percent Title II.

Agree. Additional information supporting the fire protection system will be developed.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 4

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S General

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

5 GENERAL F&S
Results of muck spillage and shaft sump design survey of operating facilities noted but supporting data not furnished in calculations packages or elsewhere. Provide decision backup information.
T.GE.SCS.070

The results of a survey are presented in a letter report dated July/August 1988, which can be made available on request.

6 GENERAL F&S
There is evidence that F&S is not conforming to their and WMPO's quality assurance plan. An example of this is the general arrangement drawing FS-GA-0160, which has drifts not found in the Appendix A of the SDRD as well as major changes to arrangements such as shaft station excavations. Since SNL is performing the analysis to demonstrate conformance to 10 CFR 60, it is essential that F&S maintain conformance to the configuration or inform the other parties that a change in the arrangements is necessary and the analysis could be modified if necessary.

Agree. ECRs will be submitted to reflect consensus' reached at 50 Percent Review and in subsequent meetings with SNL and other Project participants.

J.GE.LJO.053

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 5

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|-------------|---|--|
| 7 | GENERAL F&S | <p>ALL F&S DRAWINGS The QALAS stamp is acceptable for Title I drawings only. Its use will be impractical for procurement and construction because it will put the responsibility of QALAS interpretation on others than the technical authors of the design; therefore, subsequent issues of F&S drawings should identify the applicable QALAS for each drawing in the drawing notes.</p> | <p>The practicality of QALAS application will be resolved as Title II design progresses. These will be determined by 60 Percent Title II.</p> |
| 8 | GENERAL F&S | <p>Drawings do not indicate a QA review and acceptance by F&S. The F&S QAPP requires a QA review of design output documents. This evidence of review should be provided prior to the inclusion of these drawings in the Title I design report.</p> | <p>The F&S drawings were considered to be "in-process" as the Project Manager and Project Design Manager did not sign the drawings. Upon satisfactory resolution and incorporation of all 100 Percent Review comments, QA will review and sign the drawings.</p> |
| 9 | GENERAL F&S | <p>Add a description of requirements for controlling the process of installation for QA Level I items including the use of hold points, travelers or checklists.</p> | <p>Agree. Will be done in Title II.</p> |

T.GE.PJK.003

F.GE.JAJ.007

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 6

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S General

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

F.GE.JAJ.008

- 10 GENERAL F&S TYPICAL DRAWING
Place QA level and QALA reference on
each drawing.

R.GE.MAF.011

- 11 GENERAL F&S SPECIFICATIONS QA
SECTION
General Comment - Quality Assurance
Section

Identify applicable criteria related to
assigned QA level and/or reference
approved QALA.

R.GE.MAF.014

- 12 GENERAL F&S TYPICAL
General Comment

QA sections to specs. should list
specific QA criteria applicable.

R.GE.MAF.016

- 13 GENERAL F&S
A consolidated review of all underground
requirements should be done ASAP to
determine the appropriateness of the
present operations plan and

F&S will confer with DOE/Project Office to
determine the project method for the QA
level identification in Title II.

Will reference the QALAS which will identify
the appropriate criteria.

Will reference the QALAS which will identify
the appropriate criteria.

Agree. The BFD and Design Scope and Planning
Document will be revised as required and
submitted for DOE approval prior to start of
Title II.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 7

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | <p>facilities. Many concepts have been revised during Title I and an updated understanding of the overall needs of the ESF should be developed before continuing with Title II. This update should include a comprehensive analysis of possible alternatives.</p> <p style="text-align: right;">K.GE.JEM.013</p> | |
| 14 | | <p>GENERAL F&S The design needs to incorporate some allowances for seals. Requirements from 10 CFR 60 should be analyzed and appropriate design criteria developed consistent with the SCP.</p> <p style="text-align: right;">K.GE.JEM.007</p> | <p>This comment was answered at the 50 Percent Review (General comment #9), and a study FS-ST-0055 has since been written. Nothing in the ESF Design precludes or prevents seals from being placed after ESF or repository development. The design is consistent with the SDRD. As additional requirements for postclosure seals are generated by SNL and incorporated into the SDRD, the design will be revised accordingly.</p> |
| 15 | | <p>GENERAL F&S The use of the work deck to access the test locations in the shaft during sinking should be reviewed with respect to safety and efficiency of operations. The stage winches are difficult to synchronize and are slow. Some twisting of the deck must be expected. This system should be</p> | <p>F&S will review the use of the work decks as access to the testing stations in the shaft.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 8

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S General

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

compared with the alternative of
outfitting the shaft as its being sunk.
K.GE.JEM.005

16 GENERAL F&S

Design criteria for rock support and
shaft lining is needed. These
criteria should address the range of
rock characteristics which are needed
to initiate the Title II design.

These criteria are needed to analyze
drift and pillar configurations which
must preclude the design of utilities
and general ESF layout. These designs
must also be reviewed for
compatibility with repository
requirements and therefore should be
done ASAP.

K.GE.JEM.008

Analyses, based on the available data, have
been completed for Title I design. F&S will
recommend the following to the Project
Office for their review and approval of the
additional scope of work entailed.

1. Integration among SNL, F&S, and others is
needed to prepare comprehensive design of
ground support and excavations. Probing in
advance of drifting where adverse ground
conditions may exist could be required to
satisfy Programatic and safety requirements.
Drifts will initially be driven at minimum
size. Enlargement will be done after ground
is assessed in small drifts.

2. All designs and draft supporting analysis
should be available for review by 30% Title
II Design Review.

3. Design impacts need to be reviewed and
assessed with respect to possible
risk/accident events or probabilities. Plan
needs to be generated before 30% with
allowance for ongoing development.

COMMENT RESOLUTION CONTINUATION SHEET

NE90102
7-88

Page 9

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-------------|--|-------------------------|
| 17 | GENERAL F&S | The drawing package does not include any drawing showing the preliminary rock support arrangement for the upper breakout level. R.GE.DLK.027 | Agree. Title II detail. |
| 18 | GENERAL F&S | The drawing package does not include any drawing showing the stratigraphic column of the upper breakout level mining horizon for drift construction. R.GE.DLK.025 | Agree. Title II detail. |
| 19 | GENERAL F&S | The drawing package does not include any drawing showing the stratigraphic column of the main test level mining horizon for drift construction. R.GE.DLK.017 | Agree. Title II detail. |
| 20 | GENERAL F&S | The drawing package does not include any drawing showing the preliminary rock support arrangement for the main test level. R.GE.DLK.026 | Agree. Title II detail. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 10

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S General

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

21 GENERAL F&S
The drawing package does not include any drawing showing the G-4 geomechanical boring log information for ES-1/ES-2 shaft construction.

R.GE.DLK.015

Agree. This is a part of the Title II package.

22 GENERAL F&S
The drawing package does not include any drawing showing the ES-1/ES-2 shaft preliminary rock support arrangement.

R.GE.DLK.016

Agree. Title II detail.

23 GENERAL F&S
Calculation FS-GA-0073, Excavation Scheduling/Mining Cycles. Indicates the plan for the infiltration test is to have the lower 6 foot drift driven last. Examine the probable stability of the test block overhead. A different development scheme may be required.

T.GE.SCS.071

Agree. Intended as a Title II calculation.

24 FS-GA-0001 GRID C,D-6,7
Label area where the infiltration test will be conducted.

G.GE.MSW.007

Agree.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 11

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-------------|---|--|
| 25 | GENERAL F&S | DRAWINGS It would be more appropriate to make the entire title of each drawing, as listed on FS-GA-0002, boldface. As it is now, there are such nondescript boldface titles as "Plan" and "Sheet 1". T.GE.EMC.015 | Disagree. Drawing format was changed to closely follow the H&N title block format per comments from the 50 Percent Review. Refer to General comment #25-9. |
| 26 | FS-GA-0003 | GRID B-1 Add symbol and explanation to cover the volcanic term "ash flow" since it is used under stratigraphic units to describe the Topopah Spring Member. G.G.MW.016 G.GE.MSW.002 | Agree. |
| 27 | FS-GA-0003 | GRID B-3 Under Geotechnical Instrumentation change the spelling of Piezimeter to Piezometer. G.GE.MSW.004 | Agree. |
| 28 | FS-GA-0003 | SYMBOLS a. "400" should be removed from "Strike and Dip" diagram. b. Piezometer (spelling correction). T.GE.DMR.017 | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 12

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S General

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

29 FS-GA-0003 D2
Change "Rock Wall" to "Rock" to allow
more general use of the symbol. (See
50%, General Comment 35).
T.GE.EMC.002

Agree.

30 FS-GA-0003 8D
Delete "National Park" from the list of
boundaries.
T.GE.EMC.011

Agree.

31 FS-GA-0003
Reserve Geology and Stratigraphic units
symbols for when design package
contains this type of information.
T.GE.SCS.036

Disagree. This information is included for
future reference to avoid omissions and
errors.

32 FS-GA-0004 B
The symbols for both F&S and H&N need to
be consistent; i.e., H&N symbol for
the lightning arrestor is not the same
as the F&S symbol, the potential
transformer symbols are different. The
mechanical symbols for pressure
reducing valve and water arrestor are
also different.
A.GE.SDF.003

Agree. The inconsistency will be resolved.

ESF 100% TECHNICAL REVIEW TITLE I

F&S General

- | | |
|--|---|
| <p>33 FS-GA-0004 4C The water meter symbol is repeated as a motor symbol on drawing FS-GA-0203. Use another symbol for an electric motor.</p> <p style="text-align: right;">T.GE.SCS.037</p> | <p>Agree. Drawing FS-GA-0004 will be corrected during Title II.</p> |
| <p>34 FS-GA-0005 T&MSS organizations other than SAIC are missing from the acronyms list.</p> <p style="text-align: right;">T.GE.SCS.038</p> | <p>Agree. Will correct.</p> |
| <p>35 FS-GA-0005 Under abbreviations, CHDR should be omitted.</p> <p style="text-align: right;">T.GE.SCS.039</p> | <p>Agree. Will correct.</p> |
| <p>36 FS-GA-0006 B4 Identify Bulk Permeability Test area.</p> <p style="text-align: right;">G.GE.RWC.008</p> | <p>Agree. F&S will remove any inconsistencies.</p> |
| <p>37 FS-GA-0006 5C Suggest adding reference to drift to Ghost Dance Fault (G.I.BG.006).</p> <p style="text-align: right;">G.GE.RWC.002</p> | <p>Agree.</p> |
| <p>38 FS-GA-0006 GENERAL Two outer waste package vertical drifts are shown horizontal rather than</p> | <p>Agree. Will make corrections.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 14

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S General

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

inclined as shown in SDRD Appendix A
(see L.I.DW-003-50% Review comment).
L.GE.DGW.006

39 GENERAL F&S SPECIFICATION
Tech. specs. should place requirements
only on the constructor. Specs. should
avoid placing spcific inspection
requirements on the contracting
officer. The C.O. has the right to
inspect all work at his discretion.
It is intended that the quality control
plans will define all the Title III
inspections needed to verify the
constructors performance to the tech.
requirements.

T.GE.IRC.013

40 GENERAL F&S
There were a number of recommendations
generated by the Fire Protection/Life
Safety subcommittee that are not
incorporated in this set of
specifications, particularly the
underground fueling of equipment.
N.GE.PEP.103

Agree.

Will incorporate when direction is recieved.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 15

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--------------------------------|---|---|
| 41 | GENERAL F&S | The ANSI standard cited will not apply to pressure testing any fire protection piping. Use NFPA standards. N.GE.PEP.119 | Agree. The applicable standard providing the greater degree of protection will apply. |
| 42 | GENERAL F&S SPECIFICATION | Measurement and payment sections should be deleted. If REECO subcontracts the work, payment clauses would be added in the special conditions. T.GE.IRC.014 | Agree. Measurement and payment are normally summarized under division 1. |
| 43 | GENERAL F&S | Due to lack of time, these specifications were not reviewed. N.GE.PEP.102 | No comment. |

COMMENT RESOLUTION SHEET

Page 1

NES0101
7/88

Document Originator H&N
Date 8/8/88
Document Title ESF 100% Technical Review
Title I
General
Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson [Signature] Date 9/15/88
QA [Signature] Date 9/15/88
A/E [Signature] Date 9/15/88
WMPO [Signature] Date 9/16/88

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 2

Name of Reviewer H&N General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-------------|---|---|
| 1 | GENERAL H&N | This comment (J.C. RW.005/C-001) from the 50 Percent Design Review has been acceptably resolved, and incorporated in the 100 Percent Design Review drawings. J.GE.RSW.002 | No H&N resolution required. |
| 2 | GENERAL H&N | The agreed resolution to a comment on the 50 Percent Title I design was that the A/E should provide information to support development of the fire protection design analysis defined in DOE Order 5480.7. Additional support in this area for preparation of the Title I Design Summary will be needed. (The relevant comment was identified as T.G.SP.020 and listed as comment No. GH-002 in the 50 Percent Design Review Report). T.GE.SWP.003 | Agree. |
| 3 | GENERAL H&N | At the 50 Percent Design Review, comment J.C. RW.002, Civil comment No. 149 addressed the relocation of the IDS Building to the Northwest of the Main Pad, as per the conceptual plan. The original comment directed the A/E to | H&N will supply the requested analysis. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N General

Page 3

COMMENT
NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

perform the Analysis and assess the impacts of re-locating the IDS Building. The comment was accepted as agreeable and the A/E agreed to submit the necessary ECR to affect the change. Subsequent to this, an ECR was judged not necessary to affect a change; however, the original premise of the comment has been violated, in that another IDS Building location has been chosen that is different than the originally agreed upon conceptual plan. Therefore, my original comment is unresolved from the 50 Percent Review.

In addition, if the new proposed location is the A/E recommended location, then as a DOE reviewer, I would direct the A/E to show that the new proposed location be justified, and that an analysis be performed to show that the IDS can be located as shown without affecting the schedule, and meeting the intended purpose of the IDS, to be ready to collect data at the start of the ES-1 shaft collar.

This comment was not resolved satisfactorily. See comment No. J.C.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 4

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|---|
| | | <p>RW.002/C-149 from the 50% Review for clarification. J.GE.RSW.001</p> | |
| 4 | | <p>GENERAL H&N All H&N drawings - references to Quality Level Assignments can be satisfied by a note or stamp saying "Quality levels of the items or activities on this drawing shall be found in the ESF Quality Assurance Level Assignment Sheets (QALAS). No drawings have been checked. T.GE.PJK.001</p> | Agree. |
| 5 | | <p>GENERAL H&N There is no evidence on the drawings that a H&N QA review of these drawings has been completed. Per the H&N QAPP QA must review design output is required. Such a review must be complete prior to these drawings appearing in the Title I design report. F.GE.JAJ.031</p> | Agree. |
| 6 | | <p>GENERAL H&N Place QA level along with QALA reference on each drawing.</p> | <p>H&N will confer with DOE/Project Office to determine the project methods for identifying the QA Level in Title II.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N General

Page 5

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| | | R.GE.MAF.010 | |
| 7 | | GENERAL H&N Identify QA Level and criteria with applicable QALAS. If no QA level is required, so state. | Same as comment GE 6. |
| | | R.GE.MAF.015 | |
| 8 | | GENERAL H&N DRAWINGS It would be more appropriate to make the entire title of each drawing, as listed on JS-025-ESF-T2, boldface. As it is now, there are such nondescript boldface titles as "Plans" and "Sections". | The H&N Drafting Manual dictates that the last line be bold face. |
| | | T.GE.EMC.016 | |
| 9 | | GENERAL H&N Lettering is much improved over 50% submittal, but much of the lettering in the first half of the drawing package is still not legible when printed at half size. Use a larger, and perhaps different style, font. (See 50%, General Comment 4). | Agree. |
| | | T.GE.EMC.001 | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N General

Page 6

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|-------------|--|---|
| 10 | GENERAL H&N | Provide a drawing to specification cross reference. F.GE.JAJ.030 | Drawings will provide the cross reference. |
| 11 | GENERAL H&N | The location of the borrow pit in Drill Hole Wash and other surface facilities must be analyzed for possible impacts on performance of the repository with respect to infiltration and for interference with surface testing. An interference map with surface testing should be provided. K.GE.JEM.012 | Will be provided in Title II design analysis. H&N has prepared a letter to the DOE Yucca Mountain Project Office requesting this information. |
| 12 | GENERAL H&N | Provide schematic flow diagrams for the surface water supply and the mine waste water systems similar to F&S Drawings FS-GA-0230 and FS-GA-0235. T.GE.RLT.014 | Will provide in Title II. |
| 13 | GENERAL H&N | There is no design shown for the communications shelter. If this is due to an assumption that it will be provided by the telephone contractor, then that is incorrect. The shelter | Agree, will provide in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 7

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| | | <p>must be provided as part of this project and the telephone company will provide the equipment.</p> <p>N.GE.DDB.002</p> | |
| 14 | | <p>JS-025-ESF-T2 .A</p> <p>This drawing does not list the two folded insert drawings in our package, JS-025-ESF-C45C and JS-025-ESF-46A (JS-025-ESF-C46A).</p> <p>N.GE.PEP.022</p> | <p>Agree.</p> |
| 15 | | <p>JS-025-ESF-T3</p> <p>There is no need for a separate symbol for on-off sprinklers as all sprinklers in a zone will be the same. The symbol shown will not show if it is only a pendant or a pendant on a drop nipple.</p> <p>N.GE.PEP.078</p> | <p>In some facilities, two separate zones will be provided. Distinction for pendant or pendant on a drop nipple will be provided in Title II.</p> |
| 16 | | <p>JS-025-ESF-T3</p> <p>The Preaction Valve Symbol is incorrect. A Preaction Valve is identical to a deluge valve. The only difference is that closed sprinklers are used instead of open sprinklers.</p> <p>N.GE.PEP.079</p> | <p>Agree, will revise callout.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N General

Page 8

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|---------------|---|---|
| 17 | JS-025-ESF-T3 | All fire doors must be automatic closing. There can be no "manual only" fire doors (NFPA and DOE standards). There is no apparent need for remote door closure and no way to determine if the door actually closed and latched without adding unnecessary circuitry. N.GE.PEP.080. | The criteria was given to H&N. H&N will request that F&S reevaluate this criteria and present it in Title II. |
| 18 | JS-025-ESF-T3 | The ABC dry chemical extinguisher symbol is incorrect. NFPA identifies ABC by Paragraph 6-4.2 of NFPA 172. N.GE.PEP.081 | Disagree, the basic intent was to show a solid square inside a triangle. NFPA 172 shows this same configuration with a larger square. Paragaraph 1-4.1 of NFPA 172 states "Basic fundamental shapes of the symbols presented in this standard are the primary emphasis of this standard". Also -14.2 states that symbols used are "susceptible to computer graphic drawing techniques". |
| 19 | JS-025-ESF-T3 | Dry chemical may not be the only type and may not be acceptable. As an example, the computer areas cannot have dry chemical extinguishers according to DOE standards. N.GE.PEP.082 | Agree, type of extinguisher will be determined in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N General

Page 9

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------------|---|---|
| 20 | JS-025-ESF-T3 | Not all extinguishers will necessarily be in cabinets. N.GE.PEP.083 | Agree, the intent is to provide a protected location against dirt, dust, and light physical abuse. H&N will agree to look at extinguisher locations and identify those which require protective cabinets. |
| 21 | JS-025-ESF-T3 | Other symbols, such as Fire Hydrant, should be added. N.GE.PEP.084 | Symbols shown reflect those used on "M" and "FP" drawings. Fire hydrants are shown on the "C" drawings. |
| 22 | JS-025-ESF-T3 .A | Two symbols should not be shown for horns/speakers. NFPA 172 identifies a speaker as a horn. N.GE.PEP.023 | Agree, there will not be two different symbols. |
| 23 | JS-025-ESF-T4 .A | The symbol for the push button station is the same as used for a manual station on drawing JS-025-ESF-T3.A. N.GE.PEP.024 | Agree, will review and change if necessary in Title II. Please note that disciplines are clearly marked for each symbol set. |
| 24 | JS-025-ESF-T4 A | The symbols for both F&S and H&N need to be consistent; i.e., H&N symbol for the lightning arrester is not the same as the F&S symbol, the potential transformer symbols are different. The | To the extent that is practical, symbols will be coordinated. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 10

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS |
|-------------|------|---------------------|
|-------------|------|---------------------|

| RESOLUTION |
|------------|
|------------|

mechanical symbols for pressure reducing valve and water arrestor are also different.

A.GE.SDF.002

25 JS-025-ESF-T5 .A
Add symbols for supervised valves (OS&Y and PIV).

N.GE.PEP.025

26 JS-025-ESF-T5 .A
Since thrust blocks require specific orientations they can be turned 90 degrees from that shown here. If turned, they will look like "bench marks". Change the bench mark symbol. (As an example, see drawing JS-025-ESF-C11.BZone 7/8-B/C).

N.GE.PEP.085

27 GENERAL H&N SPECIFICATIONS
Recommend that a submittal summary be included with each technical specification. Typically these summaries would include:

- o Title
- o Reference section

Agree.

The symbols will be marked with TB or BM, for thrust block or bench mark.

A submittal requirements summary will be incorporated into the specifications.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N General

Page 11

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

- o Action requirements
 - approval
 - information
 - quality control record
 - etc.

o Required timing

Note: Please see the F&S form.
T.GE.IRC.016

28 GENERAL H&N DIVISION 1
 SPECIFICATIONS
The outline Division 1 specifications presented here are generally redundant to the ongoing management plan process. These Division 1 type requirements will be developed and approved by the WMPO and implemented by a series of administrative procedures. ESF participating organizations will, in turn, develop internal procedures. For construction, REECO may choose to pass down certain requirements to

Will verify the Division 1 implementation requirements in Title II.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N General

Page 12

COMMENT REVIEWER'S COMMENTS
NO. PAGE

RESOLUTION

subcontractors, however, these requirements would normally be defined in the special conditions, not in the technical specifications. Recommend that these concepts be clarified before work continued on Division 1 specifications.

T.GE.IRC.018

29 SECTION 01005 2.02A
Delete. GFE will be installed by the contractor (REECo) or its subcontractors.

R.GE.LGC.027

30 SECTION 01005 .A
No comment.

T.GE.PJK.056

31 SECTION 01050 .A
Add C - "The Quality Assurance Level of the engineering activity will depend upon the QA Level of the item/activity being surveyed, evaluated or reviewed as established in the applicable ESF-QALAS".

T.GE.PJK.057

Disagree, this refers to items noted "Not in contract."

Agree

Agree.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N General

Page 13

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|--|
| 32 | | SECTION 01300 01600 AND OTHERS Paragraph 1.03.B cites DOE order 5480.4. It should not cite only a portion of the order as the entire order applies. Change this to cite "DOE Order 5480.1B, Environment, Safety, and Health Program for Department of Energy Operation". N.GE.PEP.002 | DOE Order 5480.4 should not have been cited. H&N will conform to the applicable DOE orders and DOE standards, but will cite them. |
| 33 | | SECTION 01300 3 Use this section to explain the acceptance cycle of submittals including the lead times necessary before the item is used in construction. T.GE.MCB.015 | Submittal requirements will be incorporated into the specifications. |
| 34 | | SECTION 01300 .A No comment. T.GE.PJK.058 | Agree. |
| 35 | | SECTION 01400 .A General - This specification applies in a general way to Quality Control of the activities listed in Paragraph 1.02. Unless it is supplemented by procedures for the activities it calls for i.e. checking tolerances, | See comment #28 or T.GE.IRC.018. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N General

Page 14

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

providing competent personnel, etc.,
this specification has no usefulness.
T.GE.PJK.059

36 SECTION 01400 01410
01400 or 01410: Due to problems
experienced at NTS with buried valves
in fire protection system, for the past
several years we have required that
all valves be tested for leakage and
certified by the H&N Materials Test
Lab. This has proven to be worthwhile
as the quality of the valves received is
poor (failure rate is between 25% and
70%). The valves are UL or FM listed
but cannot pass a simple UL pressure
test. This may be due to normal aging
at the supplier or other reasons. We
recommend 100% testing of valves,
before installation, as required by
DOE/NV Standard Specifications, 1980.
N.GE.PEP.001

Agree.

37 SECTION 01410 .A 1.05
Paragraph 1.05 Add Paragraph D. "The
Quality Assurance Level of the testing
activity will depend upon the QA level
of the item/activity being evaluated,
as established in the applicable ESF-

Agree.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 15

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N General

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|--|
| | | QALAS". T.GE.PJK.060 | |
| 38 | | SECTION 01600 1.05 Paragraph 1.05 Insert - The Quality Assurance Level of the materials or equipment will depend upon the QA Level of the item/activity being fabricated/performed. T.GE.PJK.061 | Agree. |
| 39 | | SECTION 01720 .A 1.05 Paragraph 1.05 Insert - "Documentation of an item or activity shall be in accordance with the applicable ESF-QALAS". T.GE.PJK.062 | Agree. |
| 40 | | SECTION 01720 302 B Determine if separate colors for recording are acceptable. All records for microfilming are supposed to be in black. R.GE.LGC.028 | We will evaluate and determine acceptability by 30% of Title II. |
| 41 | | GENERAL H&N SECTION DIV. 15 MECHANICAL: Insufficient detail on which to comment. R.GE.LGC.037 | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N General

Page 16

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| 42 | | <p>GENERAL H&N SPECIFICATION Provide a specification for the two above ground water tanks, if one specification can cover both a 10,000 gallon tank and a 150,000 gallon tank. If one specification cannot cover both tanks then provide a specification per tank. C.GE.DLP.106</p> | Agree. |
| 43 | | <p>GENERAL H&N SPECIFICATION Provide a specification for an underground POL tank. Indicate in the specification for an underground POL tank. Indicate in the specification that the tank will be double wall with continuous leak detection/monitoring. Also add that any metallic tank or piping will have cathodic protection. C.GE.DLP.107</p> | A specification will be developed for a buried tank. |
| 44 | | <p>GENERAL H&N SECTION DIV. 16 ELECTRICAL: Insufficient detail on which to comment. R.GE.LGC.038</p> | Agree. |
| 45 | | <p>GENERAL H&N ELECTRICAL As these are only outlines, there is little to comment on.</p> | Agree |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N General

Page 17

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---------------------|------------|
| | | N.GE.PEP.109 | |

COMMENT RESOLUTION SHEET

NES0101
7/88

Page 1

Document Originator H&N

Date 8/8/88

Document Title ESF 100% Technical Review

Title I

Civil

Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson

Date

QA

Date

AE

Date

WMPO

Date

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102

7/88

Page 2

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| 1 | | <p>JS-025-ESF-C1 A - C10 Change the outline coverage of sheet C26 to stop short of the four-way intersection. C.CI.DLP.001</p> | Agree. |
| 2 | | <p>JS-025-ESF-C1 A, 6B Security gate location is not consistent with location shown on JS-025-ESF-C16. T.CI.SCS.005</p> | Agree. |
| 3 | | <p>JS-025-ESF-C2 "Vicinity and Location Maps" would be a better title for this drawing. It would be better to locate this drawing as the first or second one in the set as is the identical drawing for F&S. T.CI.EMC.007</p> | <p>A. Drawing is "Vicinity and Location Maps". B. Title II.</p> |
| 4 | | <p>JS-025-ESF-C2 B Include the location and phone number of the nearest emergency medical facility. This information should be provided to allow a rapid response to a construction accident. C.CI.DLP.002</p> | The drawings are not the place for this. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 3

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--------------------------|--|--|
| 5 | JS-025-ESF-C3 B | A companion map should be included in the drawing package that shows all surface testing (i.e., as built and proposed drill holes, trenches, etc.). R.CI.DLK.004 | Will include in the Title II Design Analysis to be completed by 30% Title II. |
| 6 | JS-025-ESF-C3 B GRID E-9 | The SDRD specifies auxiliary pads are required. Yet in the overall site drawings, no mention is made of the auxiliary pads. It is not clear where the organizational trailers will have utilities provided. A.CI.SDF.004 | Auxiliary pads are called out by their names and are provided with utility stub outs. |
| 7 | JS-025-ESF-C3 | The muck storage pile is located close enough to the main pad to represent a significant source of hazardous dust for both surface work areas and the fresh air supply for the ESF. Stringent dust control procedures for the muck storage areas should be specified as part of the ESF plan. This could take the form of an enclosure for the muck storage pile or the routine stabilization of the pile by chemical means. | Routine stabilization of the muck storage pile will be an operational concern. H&N will provide a specification during Title II for dust palative that will include the muck storage pile. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 4

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|------------|
| | | B.CI.BC.010 | |
| 8 | | <p>JS-025-ESF-C3 B</p> <p>The borrow area indicated on map has not been sampled and tested for suitability for use as compacted fill material. If the borrow area is found unsuitable for use as compacted fill, it will impact the proposed site configuration (i.e., use of the borrow area as a flood diversion channel).</p> | Agree. |
| | | R.CI.DLK.003 | |
| 9 | | <p>JS-025-ESF-C3 B6 H&N</p> <p>The numbering of ES-1 and ES-2 are interchanged. Recommend changing the numbering to ES-1, ES-2, as per H&N Drawing JS-025-ESF-C4.B.</p> | Agree. |
| | | J.CI.RSW.004 | |
| 10 | | <p>JS-025-ESF-C3 E10</p> <p>Reverse the naming of ES-1 and ES-2.</p> | Agree. |
| | | T.CI.EMC.008 | |
| 11 | | <p>JS-025-ESF-C3 F10</p> <p>The "Exploratory Storage Road" should be the "Explosives Storage Road".</p> | Agree. |
| | | T.CI.EMC.009 | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

Page 5

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| 12 | | JS-025-ESF-C3 B G-3 QALAS 6.2.1-0001 also applies. T.CI.PJK.004 | Agree. |
| 13 | | JS-025-ESF-C4 B Comment R.C.DK.005 from the 50 Percent Title I Design Review has not been fully addressed (shop facility space adjacent to the shop building). The comment is repeated below: The shop building location relative to the main pad general facility arrangements will not meet REECo operational and functional space requirements as required by Performance Criteria 1 of Section 1.2.6.3 of the SDRD. The shop facility will require space adjacent to the shop building: 1. An outside access area and equipment parking area extending 30 ft. out from a multi-use area concrete apron, fenced. 2. An outside multi-use area concrete apron extending 20 ft. out from the | An ECR to change the shop requirements in the SDRD has been submitted by REECo. Upon resolution of this ECR by the ICWG, our Title II design package will be changed to reflect the resolution. The referenced ECR was withdrawn by REECo at the ICWG. The ECR will be resubmitted. |

REVIEWER'S COMMENT CONTINUATION SHEETNES0102
7/88Document Title **ESF 100% TECHNICAL REVIEW TITLE I**

Page 6

Name of Reviewer **H&N Civil**

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | |
|----------------|------|---------------------|--|
| | | | |
| | | RESOLUTION | |

shop building, located directly in front of the Mechanical, lube and mechanical/electrical bays inside the shop.

3. An outside steam cleaning concrete pad extending out 20 ft. to the side of the multi-use area.

4. An outside storage area extending out 20 ft. adjacent to the side of the shop building.

5. A side access route to the outside access area extending 20 ft. adjacent to the outside storage area and steam clean pad area, fenced and with a gate.

The shop facility sector, including the building and all adjacent areas, will require 0.3 acres as a minimum. Make the required changes as described above.

This comment impacts on JS-025-ESF-C30, JS-025-ESF-C33, and JS-025-ESF-E5.

R.CI.DLK.018

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 7

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-----------------------|---|--|
| 14 | JS-025-ESF-C4 B | No provision for LLNL Machine Shop Trailer (See L.C.DW.008-50% Review). L.CI.DGW.003 | No requirements identified in the SDRD. If required, an ECR needs to be issued to revise the SDRD. |
| 15 | JS-025-ESF-C4 | The schedule for development of the site with respect to the start of ES-1 is not presented. There will be a requirement that the beneficial occupancy of the IDS surface building will be required about 3 months before data collection (the first data is during collar construction) can be accomplished. A.CI.TJM.007 | Agree, no H&N action to Title I design. (see H&N general comment #3 or J.GE.RSW.001.) |
| 16 | JS-025-ESF-C4 .B | This drawing should be made a part of the ESF baseline per AP5.6Q as a System Interface Drawing (SID) because it describes interfaces between F&S and H&N with respect to the hoisting operation. See FS-GA-0011 Revision B. Also note that Item No. 11 is identified as the warehouse on the F&S drawing. And is "unassigned" on the H&N drawing. F.CI.JAJ.027 | A. As an agent of the ICWG, H&N is responsible for developing SIDs. This is accomplished per H&N's Procedure #029. H&N/NNWSI Procedure #029 requires the use of design interface identification sheets as a basis for SID development and the interfaces shown on the referenced drawing. Until approval of SIDs, scheduled for 30% of Title II, the identification sheets are the means for controlling interfaces. B. The building designation will be reconciled in Title I final submittal. |

REVIEWER'S COMMENT CONTINUATION SHEETNES0102
7/88

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**

Name of Reviewer **H&N Civil**

Page 8

COMMENT
NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

17 **JS-025-ESF-C4 B**
Use a note to reference the vertical and horizontal datum to be used to construct this project.

C.CI.DLP.003

This note will appear on Drawing C3, under General Notes at Title I, final submittal.

18 **JS-025-ESF-C4 B**
Provide and use a symbol to indicate the areas where new asphaltic concrete paving is to be used.

C.CI.DLP.004

No pavement has been specified. A general note will be added on Drawing C3, specifying initial surface treatment. Details will be provided in Title II.

19 **JS-025-ESF-C4 B**
Show all expansion and contraction joints to be used on the PCC slabs. Label all expansion joints and a typical contraction joint.

C.CI.DLP.005

Title II.

20 **JS-025-ESF-C4 B**
The subcontractors area is very irregular. Provide dimensions, radii, and the size of all non 90 degree angles so that the area can be properly defined.

C.CI.DLP.006

Title II.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 9

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------------|--|--|
| 21 | JS-025-ESF-C4 B | Provide the radii on all curved paved areas. C.CI.DLP.007 | See comment #18 or C.CI.DLP.004. No pavement has been specified. A general note will be added on Drawing C-3 specifying initial surface treatment. Details will be provided in Title II. |
| 22 | JS-025-ESF-C4 B | At curve data point number 4 there is a conflict with sheet C37.B. A 6 inch AC curb is shown on C37.B and is not shown on C4.B. Either indicate the extent of the curbing on sheet C4.B, or delete the reference from C37.B. C.CI.DLP.008 | Agree, will remove AC curb note from C37. |
| 23 | JS-025-ESF-C6 H6 | In the note describing where the road goes, replace "IDS" with "muck storage" to agree with the similar note on JS-025-ESF-C4. T.CI.EMC.012 | Agree. |
| 24 | JS-025-ESF-C6 H6 | Change "IDS" to "Muck Storage". N.CI.DDB.003 | Agree. |
| 25 | JS-025-ESF-C6 B | Provide spot elevations along the invert of the two "V" ditches that are | Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 10

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|---|
| | | located behind the main pad. C.CI.DLP.009 | |
| 26 | | JS-025-ESF-C11 .B Pipe sizes are difficult to read but it appears that water mains are shown as 6". DOE Order 6430.1A will require 8" water mains where serving hydrants or sprinkler systems. N.CI.PEP.026 | Agree. |
| 27 | | JS-025-ESF-C11 B Locate the center point of the new 10,000 gallon water tank with a set of coordinates. C.CI.DLP.010 | Title II. |
| 28 | | JS-025-ESF-C11 B Change the symbols for the thrust block to reflect that they are new thrust blocks and not existing ones. C.CI.DLP.011 | Agree. |
| 29 | | JS-025-ESF-C11 B Use a symbol for new asphaltic concrete to indicate the limits of the AC work. C.CI.DLP.013 | No pavement has been specified. A general note will be added on Drawing C-3 specifying initial surface treatment. Details will be provided in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 11

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|--|
| 30 | | <p>JS-025-ESF-C11 B. ZONE G7 On the north side of the Booster Pump Station there is a squared off area; please indicate what this area is. If it is a PCC slab, use the symbol from the civil legend.</p> <p>C.CI.DLP.012</p> | <p>The north "squared off" area will be deleted and the east "squared off" area will be identified as a stoop.</p> |
| 31 | | <p>JS-025-ESF-C14 B DOE/NTSO probably will not authorize REECo to remove and relocate existing trailers and equipment at the Area 25 subdock. The subdock site is currently undergoing expansion by REECo to support NNWSI Project drilling activities.</p> <p>R.CI.DLK.001</p> | <p>Location of the batch plant, aggregate stock pile and spetic and mine waste water disposal systems in relationship to the existing REECo subdock will be reevaluated and relocated by 30% of Title II.</p> |
| 32 | | <p>JS-025-ESF-C14 B The area identified for occupancy by the batch plant and aggregate stockpile should be located specifically on the drawing. The current expansion of the subdock site may have occupied some of the designated space.</p> <p>R.CI.DLK.002</p> | <p>Location of the batch plant, aggregate stock pile and septic, and mine wastewater disposal systems in relationship to the existing REECo subdock, will be reevaluated and relocated by 30% of Title II.</p> |
| 33 | | <p>JS-025-ESF-C14 B Comment R.C.DK.037 from the 50. Percent Title I Design Review has not been</p> | <p>Location of the batch plant, aggregate stock pile and septic, and mine wastewater disposal systems in relationship to the</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 12

COMMENT REVIEWER'S COMMENTS
NO. PAGE

RESOLUTION

fully addressed as agreed (stub water line to the batch plant area). Refer to Comment 2 100 Percent Title I for possible space conflicts.

The comment is repeated below:

A stub water line from the full stand water line is required to service the batch plant. Add details as necessary.
R.CI.DLK.019

34 JS-025-ESF-C16 B
At the Booster Pump House, change the 8 foot dimension to 12 foot from the edge of the AC. This change will put this sheet in agreement with sheet JS-025-ESF-C11.B.
C.CI.DLP.014

35 JS-025-ESF-C16 B, 8C
No guard shack is sited at the security gate. Explain this omission or provide guard shack.
T.CI.SCS.006

36 JS-025-ESF-C17 B, A-9
Indicate type and use of tanks shown in drawings.

existing REECO subdock, will be reevaluated and relocated by 30% of Title II.

Agree.

The requirement of guard shack has not been identified.

Location of the batch plant, aggregate stock pile and septic, and mine wastewater disposal systems in relationship to the

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 13

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|---|
| | | T.CI.THP.020 | existing REECo subdock, will be reevaluated and relocated by 30% of Title II. |
| 37 | | JS-025-ESF-C17 B, C-7 The 55 mph speed limit on the unpaved H Road would not minimize airborne particulates as required in SDRD 1.2.6.0 Constraint #11. T.CI.THP.032 | The speed limit will depend on the road surface. |
| 38 | | JS-025-ESF-C18 B Indicate the size of the two culverts that cross the access road near Zone C8. C.CI.DLP.015 | Agree. |
| 39 | | JS-025-ESF-C18 B Provide a note to indicate that all curve and survey data for the access road can be found on Sheet C40.B. C.CI.DLP.016 | Agree. |
| 40 | | JS-025-ESF-C18 B At upstream end of the two culverts that cross "H" road provide a PCC apron in front of the headwall. This will help to transition the flow into the culverts and reduce erosion on the upstream end. | Will provide CMP end sections and rip-rap in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 14

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| | | C.CI.DLP.017 | |
| 41 | | JS-025-ESF-C18 B Provide curve and survey data for the new channel work north of H road. C.CI.DLP.018 | Will provide in Title II. |
| 42 | | JS-025-ESF-C18 B At the downstream end of the four culverts, use a "L" shaped end wall to end them altogether. Also provide rip- rap protection to prevent erosion. C.CI.DLP.019 | We will use CMP end sections and rip-rap in Title II. |
| 43 | | JS-025-ESF-C18 B At sta. 388+00 at a note that states that the existing pavement will be sawcut full depth. C.CI.DLP.020 | We will address in specifications in Title II. |
| 44 | | JS-025-ESF-C18 B Re-examine the need for the vertical curve from stas. 387+00 to 389+00. There seems to be no work to be done between stas. 387+00 and 388+00, therefore no need for the vertical curve. C.CI.DLP.021 | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 15

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------------|--|--|
| 45 | JS-025-ESF-C19 B | 3-36" diameter culverts handle the combined north and south Coyote Wash water. On drawing JS-025-ESF-C20.B, 3-36" diameter culverts are required to handle the north Coyote Wash water only. Explain this inconsistency. R.CI.DLK.006 | The two locations are designed for different magnitude of floodwaters. |
| 46 | JS-025-ESF-C19 B | On the profile indicate the access road at sta. 401+70. C.CI.DLP.022 | Will provide in Title II. |
| 47 | JS-025-ESF-C19 B | On the profile at sta. 405+87.31 indicate that this is a BVC point. C.CI.DLP.023 | Will provide in Title II. |
| 48 | JS-025-ESF-C19 B | On the profile at sta. 417+62.06 label this as a BVC point and list the finish grade elevation. C.CI.DLP.030 | Will provide in Title II. |
| 49 | JS-025-ESF-C19 B | Please show the culverts that cross the north access road near H road sta. 408+00. | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 16

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | C.CI.DLP.024 | |
| 50 | | JS-025-ESF-C19 B The elevation line between H road stations 404+00 to 406+00 do not agree with what is shown on sheet C37.B; please resolve. | Agree. |
| | | C.CI.DLP.025 | |
| 51 | | JS-025-ESF-C19 B Indicate the bearing of the centerline of the new ditch. | Will provide in Title II. |
| | | C.CI.DLP.026 | |
| 52 | | JS-025-ESF-C19 B Near H road sta. 406+00, indicate the radii of the pavement edge. | No pavement has been specified. A general note will be added on Drawing C-3, specifying initial surface treatment. Details will be provided in Title II. |
| | | C.CI.DLP.027 | |
| 53 | | JS-025-ESF-C19 B Provide concrete aprons on the headwall and end wall of the four culverts that cross H road. | We will provide CMP end sections and rip-rap in Title II. |
| | | C.CI.DLP.029 | |
| 54 | | JS-025-ESF-C19 B At H road station indicate that the curve and survey data for the pad entrance road can be found on sheet | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 17

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | C37.B. C.CI.DLP.028 | |
| 55 | | JS-025-ESF-C20 B Provide bearings and curve data for the channel work upstream and downstream of the culverts that cross G4 road. C.CI.DLP.033 | Will provide in Title II. |
| 56 | | JS-025-ESF-C20 B At the three culverts that cross the G4 road show a single headwall and endwall as per sheet 24.B. Also provide the two walls with aprons, and on the downstream end add a rip-rap design. C.CI.DLP.032 | The culverts will be provided with CMP end sections and rip-rap in Title II. |
| 57 | | JS-025-ESF-C20 B On the profile a sta. 409+87.31 indicate that this is a EVC point. C.CI.DLP.031 | Will provide in Title II. |
| 58 | | JS-025-ESF-C20 .B QALAS 6.2.1-0001 applies. T.CI.PJK.005 | Agree. |
| 59 | | JS-025-ESF-C24 B Both sheets C20.B and C24.B indicate channel improvement work upstream of | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 18

COMMENT REVIEWER'S COMMENTS
NO. PAGE

RESOLUTION

the culverts that cross the G4 Road.
Ensure that the work indicated on the
two sheets agree, or remove the
indicated work from one sheet and
reference the other.

C.CI.DLP.040

60 JS-025-ESF-C24 B
Upstream of the culverts that cross G4
Road indicate the bearing of the
centerline of the channel improvement.
C.CI.DLP.039

Will provide in Title II.

61 JS-025-ESF-C24 B
At the downstream end of the culverts
that cross G4 Road provide a note
informing people that sheet C20.B shows
some channel improvement in this area.
C.CI.DLP.038

The note exists on C24 but the match line
will be extended to include the channel
work.

62 JS-025-ESF-C24 B
Provide PCC aprons on the headwall and
endwall of the three culverts that
cross G4 road. Also provide a rip-rap
design for the protection of the
endwall area.
C.CI.DLP.037

The culverts will be provided with CMP end
sections and riprap in Title II.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 19

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------------|--|---------------------------|
| 63 | JS-025-ESF-C24 B | On the profile at sta. 0+00 a BVC point is indicated. Please show the VPI and EVC associated with the BVC. C.CI.DLP.036 | Will provide in Title II. |
| 64 | JS-025-ESF-C24 B | On the profile indicate the EVC and BVC points of the 200' vertical curve which has a v.p.i. at sta. 1+15. C.CI.DLP.035 | Will provide in Title II. |
| 65 | JS-025-ESF-C24 B | On the profile at sta. 4+34.15 indicate that this is a BVC point, and show the finish grade elevation. C.CI.DLP.034 | Will provide in Title II. |
| 66 | JS-025-ESF-C24 B | Provide matchline note for drawing C20. T.CI.SCS.007 | Agree. |
| 67 | JS-025-ESF-C24 .B | QALAS 6.2.1-0001 applies. T.CI.PJK.006 | Agree. |
| 68 | JS-025-ESF-C26 B | On the profile label all BVC and EVC points and their associated finish | Will provide in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 20

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|---|
| | | grades. C.CI.DLP.041 | |
| 69 | | JS-025-ESF-C26 B The west side of the north access road shown on this sheet does not agree with what is presented on sheets C36.B and C37.B. Please coordinate these three sheets so that they are in agreement. C.CI.DLP.042 | Agree. |
| 70 | | JS-025-ESF-C26 B On the plan indicate the number of 36 inch culverts that cross the north access road at sta. 0+42, and indicate a single headwall and endwall for the culverts. C.CI.DLP.043 | A) Agree B) The culverts will be provided with CMP end sections and riprap in Title II. |
| 71 | | JS-025-ESF-C26 B Explain the cross hatched area upstream of the culverts at sta. 0+42. C.CI.DLP.044 | Not shown correctly, will be removed. |
| 72 | | JS-025-ESF-C27 B On the profile label all BVC and EVC points and their associated finish grade elevations. | Will provide in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 21

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|--|
| | | C.CI.DLP.045 | |
| 73 | | JS-025-ESF-C27 B Show the three culverts that cross the road to the explosive storage area at sta. 14+60 with single headwalls and endwalls. Also show or reference the channel work upstream or downstream of these culverts. | A) Agree. B) The culverts will be provided with CMP end sections and riprap. C) Channel work will be shown. |
| | | C.CI.DLP.047 | |
| 74 | | JS-025-ESF-C27 B Indicate the radii of pavement edges where roads intersect. | No pavement has been specified. A general note will be added on Drawing C-3, specifying initial surface treatment. Details will be provided in Title II. |
| | | C.CI.DLP.046 | |
| 75 | | JS-025-ESF-C28 B The rip-rap design is incomplete. Please provide the following information: 1. A rock gradation, not just upper and lower rock sizes. 2. Layer thickness of the rip-rap (approximately 1.5 x largest rock size). 3. Minimum specific weight of the | Will provide in Title II specifications. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 22

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|--|
| | | <p>rock.</p> <p>4. Exact dimensions of the rip-rap placement.</p> <p>5. Indicate if a bedding layer is needed.</p> <p style="text-align: right;">C.CI.DLP.049</p> | |
| 76 | | <p>JS-025-ESF-C28 B</p> <p>On the profile label all BVC and EVC points, and indicate their associated finish grades.</p> <p style="text-align: right;">C.CI.DLP.048</p> | Will provide in Title II. |
| 77 | | <p>JS-025-ESF-C31 .B</p> <p>The second "Reference Drawing" is not readable.</p> <p style="text-align: right;">N.CI.PEP.027</p> | Agree. |
| 78 | | <p>JS-025-ESF-C31 .B</p> <p>The separation between application of QALAS should be shown because 1.2.6-0001 is Level I and 6.2.2-0001 is Level III.</p> <p style="text-align: right;">T.CI.PJK.007</p> | Disagree, this is the reason for referencing the QALAS. The QALAS are the best and official place to define the quality level. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 23

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------------|---|----------------------------------|
| 79 | JS-025-ESF-C36 B, 2E | Schematics indicate compressed airline is 12 inches and not 8 inches as noted here. T.CI.SCS.008 | Agree. |
| 80 | JS-025-ESF-C36 B | Provide Title I preliminary engineering drawings for the generator building identified on drawing JS-025-ESF-C36.B. Provide drawing details similar to what was provided for the change house, warehouse, hoist house, etc. R.CI.DLK.023 | Will provide by 30% of Title II. |
| 81 | JS-025-ESF-C36 B | The ditch area on the west side of the north access road does not agree with what is shown on sheet C26.B. Please coordinate these two sheets. C.CI.DLP.050 | Agree. |
| 82 | JS-025-ESF-C37 B | Indicate that the "buried fuel tank" is new. C.CI.DLP.052 | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 24

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|-------------------------------|--|--|
| 83 | JS-025-ESF-C37 B | Please indicate that the buried fuel tank will be of a double wall construction with continuous leak detection. Also add that if a ferrous tank is used, cathodic protection will be provided. C.CI.DLP.105 | Will provide in Title II specifications. |
| 84 | JS-025-ESF-C37 B | There is a buried fuel tank indicated to serve the substation, but no specifications are given for the tank. Notification to the state of Nevada is required for this tank, and that requirement must be included in the submittals for the tank specifications. R.CI.OLH.003 | A portion of specifications will be provided by 30% of Title II. |
| 85 | JS-025-ESF-C37 B, 11C | 12 inch air line, not 8 inches. T.CI.SCS.009 | Agree. |
| 86 | JS-025-ESF-C37 B-ZONE A/B-8/9 | Move the pedestrian stairway about 50 to 60 feet to the south. In addition, include a 3 foot wide asphalt walkway along the south side of the main pad | The precise location will be provided by 30% of Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 25

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|------------|
| | | <p>from the top of the pedestrian stairway to the vicinity of the changehouse. This will eliminate foot traffic through the REECO shop and shaft sinking subcontractors work areas. R.CI.RRR.001</p> | |
| 87 | | <p>JS-025-ESF-C37 B Furnish pedestrian stairways to other parking levels as shown at drawing location 9C. Suggest stairways at general locations 8D, 7C, 6C, and 6E. T.CI.SCS.010</p> | Agree. |
| 88 | | <p>JS-025-ESF-C37 B Provide a pedestrian stairway between the two largest lower parking areas. C.CI.DLP.055</p> | Agree. |
| 89 | | <p>JS-025-ESF-C37 B Provide pedestrian access from the lower parking areas south of H road to the main pad. C.CI.DLP.056</p> | Agree. |
| 90 | | <p>JS-025-ESF-C37 B The elevation lines shown on this sheet for H road east of the lower parking areas do not agree with what is shown on</p> | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 26

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|--|
| | | <p>sheet C19.B. Please rectify the differences between these two sheets. C.CI.DLP.059</p> | |
| 91 | | <p>JS-025-ESF-C37 B Label the five lower parking pads A-E or 1-5 for easier identification. C.CI.DLP.051</p> | Disagree. |
| 92 | | <p>JS-025-ESF-C37 B The H road match line to sheet C20.B does not show up on sheet C20.b. Please rectify. C.CI.DLP.057</p> | Agree. |
| 93 | | <p>JS-025-ESF-C37 B Where the three culverts cross the north access road show a single headwall and endwall with a ACC apron. C.CI.DLP.060</p> | The culverts will be provided with CMP end sections and rip-rap. |
| 94 | | <p>JS-025-ESF-C37 B Indicate the radii of all pavement edges at road intersection areas. C.CI.DLP.053</p> | No pavement has been specified. A general note will be added on Drawing C-3, specifying initial surface treatment. Details will be provided in Title II. |
| 95 | | <p>JS-025-ESF-C37 B In Zone F9 provide a complete rip-rap design as per previous comment.</p> | Will provide in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 27

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| | | C.CI.DLP.054 | |
| 96 | | JS-025-ESF-C37 B Indicate the sizes of the MWW and SS lines that leave the main pad. Also show these lines with the correct symbol for new utility lines. C.CI.DLP.058 | Agree. |
| 97 | | JS-025-ESF-C38 .B Liner should be of sufficient size to collect all fluids in muck storage pile area. Show muck storage liner boundaries. T.CI.THP.021 | Agree, more details will be provided by 30% of Title II. |
| 98 | | JS-025-ESF-C38 B The borrow pit muck storage pad designation is unclear. Prior use of the muck storage pad area as a borrow pit is not indicated on JS-025-ESF-C3.B. If so, area has not been sampled and tested to determine if borrow material is adequate for compacted fill. R.CI.DLK.007 | Agree, more details will be provided by 30% of Title II pending access to the borrow pit area. |
| 99 | | JS-025-ESF-C38 B Provide centerline stationing, bearings, and curve data for both the "muck | Will provide in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 28

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| | | <p>storage access road" and channel work. Please note that this is the only sheet that shows the "muck storage access road."</p> <p style="text-align: right;">C.CI.DLP.061</p> | |
| 100 | | <p>JS-025-ESF-C38 B Use a symbol for new asphaltic concrete pavement to show the limits of the new paving.</p> <p style="text-align: right;">C.CI.DLP.062</p> | <p>No pavement has been specified. A general note will be added on Drawing C-3, specifying initial surface treatment. Details will be provided in Title II.</p> |
| 101 | | <p>JS-025-ESF-C39 13 Show the connection of the 8 inch drain pipe from the detention pond to the MWW pipe from the main pad on a larger scale sheet.</p> <p style="text-align: right;">C.CI.DLP.064</p> | <p>Will provide in Title II.</p> |
| 102 | | <p>JS-025-ESF-C39 B Indicate the degree of bend in the 8 inch drain pipe from the detention pond where it makes a non 90 degree bend.</p> <p style="text-align: right;">C.CI.DLP.063</p> | <p>Will provide in Title II.</p> |
| 103 | | <p>JS-025-ESF-C39 B, 11C The detention pond drain pipe is cut short.</p> <p style="text-align: right;">T.CI.SCS.011</p> | <p>Agree.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 29

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------------|--|--|
| 104 | JS-025-ESF-C39 B | Show the required survey data for the "muck storage access road," and use a new AC symbol to indicate the paving limits. C.CI.DLP.065 | Agree. |
| 105 | JS-025-ESF-C39 B | Provide the required survey data for the access road that goes to the open storage area. C.CI.DLP.066 | Will provide in Title II. |
| 106 | JS-025-ESF-C39 B | Provide a profile of the access road that goes to the open storage area. C.CI.DLP.067 | Will provide in Title II. |
| 107 | JS-025-ESF-C39 B | Sheet C39.B has an access road with shoulders on the north side of the equipment storage area. On sheet C40.B this road is not seen. Please indicate where the road is to end. C.CI.DLP.069 | The match line location is at the "daylight" point of the road. |
| 108 | JS-025-ESF-C39 B | Provide a single endwall where the three culverts cross H road. | Culverts will be provided with CMP end sections and rip-rap in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**

Name of Reviewer **H&N Civil**

Page 30

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| | | C.CI.DLP.068 | |
| 109 | | JS-025-ESF-C39 B C.6 Show slopes for topsoil storage area. T.CI.THP.022 | Will provide by 60% of Title II. |
| 110 | | JS-025-ESF-C39 B, D 8-10 Resolve differences in size of the inflow and outflow pipes. T.CI.THP.028 | Agree. |
| 111 | | JS-025-ESF-C39 D, 8-10 The collection pond below the muck storage pile should be a retention pond, not a detention pond. The pond should be sized to be able to contain all the runoff from the muck pile, in the event of a 100- year flood (as well as containing any leachage from the muck pile). T.CI.THP.027 | A) Disagree because the pond will discharge, outflow will be valved and controlled based on effluent quality. B) Agree. |
| 112 | | JS-025-ESF-C40 B ZONE B-8 Move the warehouse building to the northeast far enough to allow access of a forklift through a large door on the southwest side of the warehouse. Refer to comment No. R.AR.RRR.005. R.CI.RRR.017 | Will provide by 30% of Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 31

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|--|
| 113 | | JS-025-ESF-C40 B Provide a centerline bearing for the new drainage channel. C.CI.DLP.070 | Will provide in Title II. |
| 114 | | JS-025-ESF-C40 B Where the four culverts join on the north side of H road reference sheet C18.B for the downstream channel work. C.CI.DLP.071 | It is referenced. |
| 115 | | JS-025-ESF-C40 B, 7E, 6F, AND 4G Shift ramps between benches southward along bank away from drainage channel to; 1) avoid erosion of ramps in the event of a flash flood, and 2) run ramp along face of bank to reduce use of bench area by ramp. Add pedestrian stairways between benches. T.CI.SCS.012 | Will consider in Title II. |
| 116 | | JS-025-ESF-C40 B ZONE D-2&3 Redesign the access road from the "H" road to the southeast equipment storage pad by eliminating the "S" curve and making the access road straight. R.CI.RRR.018 | Will provide preliminary by 30% of Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 32

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-------------------|--|---|
| 117 | JS-025-ESF-C41 | An unincorporated comment from ESF Title I 50 Percent Review: | Facilities are currently being relocated. |
| | | The water from site runoff and mine waste water looks like it will affect the sewage leachate system. | |
| | | Show why the mine wastewater will not affect the sewage leachate system. T.CI.THP.003 | |
| 118 | JS-025-ESF-C41 | An unincorporated comment from ESF Title I 50 Percent. | This was provided in the calculations (#C-0018, PP-6) as agreed to at 50% Title I. |
| | | "State the design capacity of the system in gallons/day/person. (SDRD Page 2.3-1, performance criteria #2)" T.CI.THP.004 | |
| 119 | JS-025-ESF-C41 .B | An unincorporated comment from Title I 50%: | This was provided in the calculations (#C-0019, PP-6 & 7) as agreed to at 50% Title I. At this time, we can only make assumptions as to the quality of the mine wastewater. These assumptions are that only suspended solids and oil will affect water quality of the effluent. |
| | | If the mine wastewater system is designed to discharge water, then a NPDES permit may be required. This permit may have very stringent | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

Page 33

| COMMENT NO. | PAGE REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---|---|
| | <p>requirements. The design for water treatment may require "Best Available Technology" treatment before being released. (SDRD pp. 0-4, constraints 1.a.). Provide data on quantity and quality of water for mine wastewater system as stated in Title I Design Basis Document.</p> <p style="text-align: right;">T.CI.THP.005</p> | |
| 120 | <p>JS-025-ESF-C41 .B CIVIL</p> <p>An unincorporated comment from ESF Title I 50 Percent. "According to SDRD, page 2.5-1, performance criteria #2, the wastewater is supposed to be collected and pumped for offsite disposal where as, this drawing shows the water being discharged." Resolve conflict between SDRD and proposed wastewater design.</p> <p style="text-align: right;">T.CI.THP.002</p> | <p>At 50% Title I we proposed to submit an ECR to resolve the apparent conflict in SDRD 1.2.6.2.5, performance criteria #2 and constraint #1. To date this has not been accomplished but will be in the immediate future. The "discharge" is an "environmentally acceptable manner" as outlined in constraint #1.</p> |
| 121 | <p>JS-025-ESF-C41 B</p> <p>There are problems with the waste lines as shown on this sheet and sheets C43.B and C44.B. These problems include the line locations, sizes, and if the line is gravity or a force main. Subsequent comments will address specific problems, however, the entire waste line system</p> | <p>A. Line locations are approximate for Title I.</p> <p>I. Locations will be finalized by 30% Title II.</p> <p>B. Sizes will be corrected.</p> <p>C. Forced and gravity main design is described on Page 7, Calculation #C-0019.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 34

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | <p>should be coordinated. C.CI.DLP.072</p> | |
| 122 | | <p>JS-025-ESF-C41 Provide a distribution box at the head of the leach field pipes to prevent one pipeline from becoming overloaded. C.CI.DLP.087</p> | Will provide in Title II. |
| 123 | | <p>JS-025-ESF-C41 B Provide invert elevations of the leach field pipes and the 8 inch header pipe. C.CI.DLP.086</p> | Will provide in Title II. |
| 124 | | <p>JS-025-ESF-C41 B A 8 inch -SS- is shown on this sheet while a 3 inch -SS- force line is shown on C43.B and C44.B. C.CI.DLP.073</p> | The forced line becomes a gravity flow system as described in the calculations. Details will be provided in Title II. |
| 125 | | <p>JS-025-ESF-C41 B Where the -SS- makes a 90 degree bend, provide a manhole. C.CI.DLP.074</p> | Will be provided in Title II. |
| 126 | | <p>JS-025-ESF-C41 B If the -SS- is a force line provide a check valve just before the septic</p> | The line is gravity flow at this point. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 35

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| | | <p>tank.</p> <p style="text-align: right;">C.CI.DLP.075</p> | |
| 127 | | <p>JS-025-ESF-C41 B Change the label on the 6" waste water line to MWW so that it is consistent with Sheet C44.B. Also indicate if it is a force main or gravity line.</p> <p style="text-align: right;">C.CI.DLP.077</p> | Agree. |
| 128 | | <p>JS-025-ESF-C41 B Show where the waste oil is to be stored until it can properly be removed from the site.</p> <p style="text-align: right;">C.CI.DLP.078</p> | The oil will be removed properly when the oil water separator is full. |
| 129 | | <p>JS-025-ESF-C41 B Show the pipeline size of the pipe that leaves the oil/water separator. Also show the inverts of that pipeline.</p> <p style="text-align: right;">C.CI.DLP.079</p> | Will be provided in Title II. |
| 130 | | <p>JS-025-ESF-C41 B Provide the inverts of the pipelines at the inlet and outlet of the septic tank.</p> <p style="text-align: right;">C.CI.DLP.080</p> | Will be provided in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 36

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------------|---|-------------------------------|
| 131 | JS-025-ESF-C41 B | Locate the corners of the fence around the lagoon via a set of coordinates. This will help ensure the proper alignment and orientation of the lagoon system. C.CI.DLP.081 | Will be provided in Title II. |
| 132 | JS-025-ESF-C41 B | Show the lagoon top of berm elevations and the bottom elevation. C.CI.DLP.082 | Will be provided in Title II. |
| 133 | JS-025-ESF-C41 B | Show the invert elevations of the lagoon's 8 inch outlet pipe. C.CI.DLP.083 | Will be provided in Title II. |
| 134 | JS-025-ESF-C41 B | Consider moving the concrete splash block back toward the lagoon near the 3890' elevation to reduce the erosion effect of the ditch flow on the splash block foudation. C.CI.DLP.084 | Will consider in Title II. |
| 135 | JS-025-ESF-C41 B | Provide a complete rip-rap design at the splash block area. This design should | Will provide in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 37

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | <p>contain the required information in prior comment. C.CI.DLP.085</p> | |
| 136 | | <p>JS-025-ESF-C41 B Show the radii of all rounded pavement areas. C.CI.DLP.076</p> | <p>No pavement has been specified. A general note will be added on Drawing C-3, specifying initial surface treatment. Details will be provided in Title II.</p> |
| 137 | | <p>JS-025-ESF-C42 B At the water tank pad show the location of the 12 inch water line that serves the tank. C.CI.DLP.088</p> | <p>Will provide in Title II.</p> |
| 138 | | <p>JS-025-ESF-C42 B At the water tank pad show a complete rip-rap design. C.CI.DLP.089</p> | <p>Will provide in Title II.</p> |
| 139 | | <p>JS-025-ESF-C42 B The G-4 pad has no identified use except for access to and preservation of the G-4 drill hole collar. Dirtwork and flood control work should be justified by a determination of G-4 pad for operational use. R.CI.DLK.005</p> | <p>The justification has been provided in the SDRD.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 38

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------------------|--|---------------------------|
| 140 | JS-025-ESF-C42 B | At the G4 pad show where the 12 inch water line crosses the pad as indicated by sheet C43.B. C.CI.DLP.090 | Will provide in Title II. |
| 141 | JS-025-ESF-C42 B | At the G4 pad provide a complete rip-rap design. Be very careful in how the toe area of the rip-rap is designed to avoid erosion of the toe area. C.CI.DLP.091 | Will provide in Title II. |
| 142 | JS-025-ESF-C43 AND C44 | Suggest placing water supply, waste water, and sewage systems on separate utility plan drawings for clarity (similar to 50 percent drawings). Also, add water supply line to muck storage area. Increase scale of utility plan drawings for clarity. T.CI.RLT.003 | Will provide in Title II. |
| 143 | JS-025-ESF-C43 B | Sheet C44.B does not agree with this sheet as to the location of the 3"-SS- in respect to the 6"WW. Please resolve. C.CI.DLP.092 | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 39

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------------|--|---|
| 144 | JS-025-ESF-C43 B | Sheet C41.B does not agree with this sheet as to the size of the sanitary sewer line. Please resolve. C.CI.DLP.093 | Agree. |
| 145 | JS-025-ESF-C43 B | Change the 8" WW label to 8" MWW to be consistent with other drawings. C.CI.DLP.094 | Agree. |
| 146 | JS-025-ESF-C43 B | The intersection of the 8" drain line from the detention pond to the 8" MWW from the main pad should be shown on a larger scale map to more effectively locate the connection point. C.CI.DLP.095 | Will provide in Title II. |
| 147 | JS-025-ESF-C43 B | The angle at which the MWW and -SS- leaves manhole number 3 is different between sheets C43.B and C44.B. Please resolve. C.CI.DLP.096 | Agree. |
| 148 | JS-025-ESF-C43 E9 | There is no water line going to the communications shelter for fire | H&N will reinvestigate the necessity for a water line to that building. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 40

COMMENT REVIEWER'S COMMENTS
NO. PAGE

RESOLUTION

protection.

N.CI.DDB.006

149 JS-025-ESF-C43 B
General Notes:

Add: QALA No. 1.2.6-0001

R.CI.MAF.007

150 JS-025-ESF-C44
By DOE Order, portable structures must
meet DOE/EV-0043, Standard on Fire
Protection of Portable Structures, which
should be cited.

N.CI.PEP.087

151 JS-025-ESF-C44
All fire protection systems above ground
and underground, if not on potable
water, must have all pendant sprinklers
fed from return bends (NFPA 13).

N.CI.PEP.089

152 JS-025-ESF-C44
Post indicator valves are not properly
protected by post barricades per NTS
standards.

N.CI.PEP.088

Agree.

The structures are designed to meet DOE/EV-0043, but DOE orders are not cited on drawings. Purchase specifications will be submitted at the next submittal of Title II.

All surface fire protection systems are on potable water. H&N will reinvestigate and conform to NFPA 13.

Will provide by 30% of Title II.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 41

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|--|
| 153 | | JS-025-ESF-C44 .B Indicate the interface between potable and non-potable water systems and show means of preventing backflow or back siphonage of non-potable water to comply with 30 CFR 57.20002. T.CI.SWP.004 | Will provide in Title II. |
| 154 | | JS-025-ESF-C44 .B The waterline appears to be 12" but DOE Order 6430.1A will require a looped system rather than the dead end system shown here. N.CI.PEP.028 | Per DOE Order 6430.1A the looped system is required if feasible. It is not feasible in this situation. |
| 155 | | JS-025-ESF-C44 .B On the south side there are 6 buildings in a row. Building #1, on the left, appears to have no sprinkler system. Sprinklers should be required. Buildings 2,3,4, and 5 appear to have two sprinkler systems where one system would be adequate. N.CI.PEP.086 | Building #1 is the Surface Data Building and is sprinkled. The trailers have separate systems to enable them to be relocated if needed during various stages of the project. |
| 156 | | JS-025-ESF-C44 B Show black box for tracer injection system for water system. T.CI.THP.023 | Agree. Will be shown by 30% Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**

Name of Reviewer **H&N Civil**

Page 42

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|----------------------------------|
| 157 | | JS-025-ESF-C44 B In Zone C3 provide thrust blocks at the pipeline bends. Also indicate the degree of pipeline bend. <p align="right">C.CI.DLP.097</p> | Will provide in Title II. |
| 158 | | JS-025-ESF-C44 B Make the nomenclature of the dual grinder pump and lift station agree with sheets C43.B and C44.B. <p align="right">C.CI.DLP.098</p> | Agree. |
| 159 | | JS-025-ESF-C44 B Indicate the bearings of the MWW and - SS- lines where they leave manhole number 3. <p align="right">C.CI.DLP.099</p> | Will provide in Title II. |
| 160 | | JS-025-ESF-C44 B Change the -WW- to -MWW- to be consistent. <p align="right">C.CI.DLP.100</p> | Agree. |
| 161 | | JS-025-ESF-C44 B Show the size of the water lines that directly feed the fire hydrants. <p align="right">C.CI.DLP.101</p> | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 43

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|---------------------|---|--|
| 162 | JS-025-ESF-C44 B | Several water line appurtenances are shown with the symbols for existing materials. Please check these items to ensure that they really are existing. C.CI.DLP.102 | Agree. |
| 163 | JS-025-ESF-C44 B | Show the invert elevations of all utility lines at the point where they enter a structure. C.CI.DLP.103 | Will provide in Title II. |
| 164 | JS-025-ESF-C44 B | In zones C9 and C10 indicate the degree of pipe bend in the 12 inch and 6 inch water lines. C.CI.DLP.104 | Will provide in Title II. |
| 165 | JS-025-ESF-C44 B | No provision for LLNL Machine Shop Trailer (See L.C.DW.008-50% Review). L.CI.DGW.004 | No requirements identified in the SDRD. If required, an ECR needs to be issued to revise the SDRD. |
| 166 | JS-025-ESF-C44 B C3 | Show how power will be provided to the dual grinder pump and lift station for the sanitary sewer line. R.CI.IJF.006 | Agree. Will be provided at 30% Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 44

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--|--|------------|
| 167 | JS-025-ESF-C44 General Notes: | Add: QALA No. 1.2.6-0001 R.CI.MAF.008 | Agree. |
| 168 | JS-025-ESF-C45 B Omit this drawing in favor of most current version of JS-025-ESF-46A. T.CI.SCS.013 | C45B will be replaced with C45C and C46A. | |
| 169 | JS-025-ESF-C45 C, D8, D9 Change ESF #1 and ESF #2 to read ES-1 and ES-2. G.CI.RWC.007 | Agree. | |
| 170 | JS-025-ESF-C46 H&N An unincorporated comment from ESF Title I, 50 Percent Design Review was: Show overlay of 100-year floodplain for all facilities (including mine wastewater, sewage system). The design of any facility built in the 100-year floodplain must incorporate designs criteria to minimize harm to floodplains (DOE General Design Criteria, 6430.1A 0285.3.2.5) (Executive Order 11988, Floodplain Management). Show design | The facilities are being relocated and designed per DOE 6430.1A. This will be evident in the Title II design analysis. | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 45

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|--|
| | | <p>criteria used to protect facilities in 100-year floodplain.</p> <p>T.CI.THP.001</p> | |
| 171 | | <p>JS-025-ESF-C46</p> <p>This is one of two folded drawings added to our package. I believe this should be shown as a Civil drawing, JS-025-ESF-C46A.</p> <p>N.CI.PEP.021</p> | <p>Agree.</p> |
| 172 | | <p>SECTION 02110 .A AND 02211.A</p> <p>Although the specification is consistent with Constraint 11 of SDRD 1.2.6.1, the specification should be more specific as to what is required. The original requirement was to stockpile the top 6 inches of the material from all cleared areas to preserve natural seeds for future reclamation.</p> <p>A.CI.TJM.006</p> | <p>Agree. H&N will expand on this on next submittal of Title II.</p> |
| 173 | | <p>SECTION 02110 PAGE 3, 3.05A</p> <p>Show location and design criteria (slopes, size, etc.) of waste material disposal area.</p> <p>T.CI.THP.007</p> | <p>These are or will be shown on drawings, not specifications.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 46

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------------------|--|--|
| 174 | SECTION 02110 .A 1.05 | Paragraph 1.05 Quality Assurance Level shall be in accordance with ESF-QALAS No. 6.2.1-0001. T.CI.PJK.063 | Agree, in next submittal of Title II. |
| 175 | SECTION 02110 1.06.A | "Coordinate clearing work with utility companies." This would work better with a dig permit. Reword as follows: "Before the start of site clearance, a dig permit shall be obtained from the local governing agency." The dig permit should be defined in the Title II specifications to include right of way permits, utility locations, and other agencies signoffs such as the Desert Research Institute for archaeology. T.CI.MCB.001 | Agree, in next submittal of Title II. |
| 176 | SECTION 02110 1.01 | Include heading for Dust Control Activities. T.CI.THP.039 | Agree, will add in next submittal of Title II. |
| 177 | SECTION 02202 .A | Add Paragraph B. Explosive procurement shall be in accordance with applicable ESF-QALAS. | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 47

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| | | T.CI.PJK.064 | |
| 178 | | SECTION 02202 1.04.A "Submit shop drawings." Shop drawings are not normally submitted for rock removal. "Submit blast patterns" might be more appropriate as discussed in paragraph 1.04.B. T.CI.MCB.003 | Agree. H&N will delete the phrase, "submit shop drawings." |
| 179 | | SECTION 02202 1.06 P.2 Add section "Comply with Department of Transportation requirements for transporting hazardous materials." T.CI.THP.038 | Agree. |
| 180 | | SECTION 02211 .A 1.05 Paragraph 1.05 - Quality Assurance Level shall be in accordance with ESF-QALAS No. 6.2.1-0001. T.CI.PJK.065 | Agree. |
| 181 | | SECTION 02211 PAGE 3, PART 3 Section 1.01C implies there may be some fill placement involved in this work. If so, add a numbered section under Part 3 to cover the fill placement. T.CI.EMC.041 | Disagree, items of fill will be covered in Section 02223. In related work, H&N will direct reader to the proper section. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 48

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--------------------------------|---|---|
| 182 | SECTION 02211 2.01 | Definitions of topsoil and subsoil need to be revised to incorporate reclamation requirements (i.e. vegetative materials should be left in topsoil). T.CI.THP.034 | Agree, H&N will add definition of top soil in next submittal of Title II. |
| 183 | SECTION 02211 PAGE 3, 3.01A | A reclamation plan is being prepared by T&MSS reclamation specialists. Input from these reclamation specialists should be incorporated into topsoil requirements. T.CI.THP.008 | Agree, H&N will contact T&MSS for their recommendations. |
| 184 | SECTION 02211 3.01 E | Replace "utility operating company" with "local responsible agency." T.CI.MCB.002 | Agree. |
| 185 | SECTION 02211 3.02 PAGE 3 | Renummer 3.02 sub-soil excavation as 3.03 and change 3.03 tolerances to 3.04. Delete C from Subsoil excavation as no large roots exist in ESF area. G.CI.MSW.014 | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

Page 49

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------------------------|--|--|
| 186 | SECTION 02211 PAGE 3 | 3.02B Show location and design criteria (slopes, size, etc.) of subsoil stockpile. T.CI.THP.009 | These are or will be shown on drawings, not specifications. |
| 187 | SECTION 02211 3.02.C | Do not specify the method of cutting roots. T.CI.MCB.009 | Agree. |
| 188 | SECTION 02211 PAGE 3, 3.03B | A finished grade tolerance of +/- 1/8 inch does not belong in a Rough Grading specification. Remove this item. T.CI.EMC.042 | Agree. |
| 189 | SECTION 02222 PAGE 3, 2.01B | Delete definition of pea gravel as it is not needed. The only reference to fill in this excavation specification is in 3.02E, but that work is covered in Section 02223, which also specifies the pea gravel. T.CI.EMC.043 | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 50

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--------------------------------------|--|--|
| 190 | SECTION 02222 3.01.D | Replace "utility company" with "local responsible agency." T.CI.MCB.004 | Agree. |
| 191 | SECTION 02222 3.02.B | Put in a reference to Table P-1 Approximate Angle of Repose contained in 29 CFR 1926.652 page 204 (revised as of 7-1-87). T.CI.MCB.005 | Agree. H&N will change to read, ".... to slopes shown on plans...." |
| 192 | SECTION 02222 PAGE 4 302.F | Indicate area designated on site for stockpiling excavated material. T.CI.THP.012 | This is or will be shown on drawings, not specifications. |
| 193 | SECTION 02222 PAGE 4, H4 | For greater clarity, state the slope as 2h:1v instead of two-to-one. T.CI.EMC.040 | Agree. |
| 194 | SECTION 02222 .A | No comment. T.CI.PJK.066 | No resolution required. |
| 195 | SECTION 02223 PAGE 1 | Since this appears to be the only section that covers fill in the | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 51

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------------------|--|--|
| | | specification, a more appropriate title would be "Fill" or "Fill and Backfill". T.CI.EMC.044 | |
| 196 | SECTION 02223 PAGE 2, 1.02 | Add Section 01410-Testing Laboratory Services to list of related work. This is mentioned in 3.05A. T.CI.EMC.045 | Agree. |
| 197 | SECTION 02223 .A 1.05 | Paragraph 1.05 Quality Assurance Level shall be in accordance with ESF-QALAS No. 6.2.1-0001. T.CI.PJK.067 | Agree. |
| 198 | SECTION 02223 3.01 | Paragraph 3.01: Add an initial requirement to "Verify that all inspections and tests, of equipment to be buried, have been performed and accepted". Unless someone reviews and accepts the work, we could just be burying mistakes or requiring that it be dug up for final inspection. This comment also applies to H&N Spec 02225. N.CI.PEP.003 | Agree, will be incorporated in next submittal of Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 52

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| 199 | | SECTION 02223 3.01.D Clarify to disallow standing water but still allow moisture in the soil. T.CI.MCB.006 | Agree, this will be clarified in next submittal of Title II. |
| 200 | | SECTION 02223 PAGE 4 3.03J Show location and size of site for surplus back fill material. T.CI.THP.013 | This will be reflected on the drawings. |
| 201 | | SECTION 02223 3.05.A The option of using in place nuclear density testing should be maintained. T.CI.MCB.007 | Agree. |
| 202 | | SECTION 02223 PAGE 5, 3.06 A4 Increase the depth of high compaction zone under concrete slabs. Suggest 4 feet instead of 12 inches. T.CI.EMC.046 | Will be considered for incorporation in Title II. If not incorporated, the reviewer will be informed why. |
| 203 | | SECTION 02225 PAGE 2, 1.02 To the list of related work add: Section 01050 - Field Engineering, Section 01410 - Testing Laboratory Services, Section 02202 - Rock Removal. These are mentioned in 3.02A, 2.03A and | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 53

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|--|
| | | 3.03D respectively. T.CI.EMC.047 | |
| 204 | | SECTION 02225 .A 1.05 Paragraph 1.05 Quality Assurance Level shall be in accordance with ESF-QALAS No. 6.2.1-0001. T.CI.PJK.068 | Agree, in next submittal of Title II. |
| 205 | | SECTION 02225 3.01.C Clarify to disallow standing water, but still allow moisture in the soil. T.CI.MCB.010 | Agree, this will be clarified in next submittal of Title II. |
| 206 | | SECTION 02225 3.05 A Paragraph 3.05 A: Should be revised. The only support allowed for water mains serving fire protection, is earth, along the entire length of pipe. Wood blocks or other supports, holding the pipe above grade, are not allowed as, when back filled. These impose point loads on the pipe. N.CI.PEP.004 | Agree. |
| 207 | | SECTION 02225 3.07.A The option of using in place nuclear density testing should be maintained. T.CI.MCB.008 | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 54

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--|------------------------|--|
| 208 | SECTION 02500 No comment. | .A T.CI.PJK.069 | No resolution required. |
| 209 | SECTION 02556 Recommend that DOE/NV Standard Specifications, 1980, be used as a guide for technical requirements. N.CI.PEP.005 | | Agree. |
| 210 | SECTION 02556 .A 1.05 Paragraph 1.05 Quality Assurance Level shall be in accordance with ESF-QALAS applicable to the systems of which these water lines will be components. T.CI.PJK.070 | | Will be incorporated in Title II. |
| 211 | SECTION 02611 Recommend that the source of material be established during Title II design. T.CI.IRC.019 | | Disagree, material may be site produced. |
| 212 | SECTION 02611 PAGE 2, 1.02 To the list of related work, add 02211- Rough Grading, which is mentioned in 3.03A. T.CI.EMC.048 | | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 55

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|---------------|--|--|
| 213 | SECTION 02611 | .A No comment. T.CI.PJK.071 | No resolution required. |
| 214 | SECTION 02612 | .A No comment. T.CI.PJK.072 | No resolution required. |
| 215 | SECTION 02613 | .A 1.05 Paragraph 1.05 Quality Assurance Level shall be in accordance with ESF-QALAS 6.2.1-0001. T.CI.PJK.073 | Agree, will add in next submittal of Title II. |
| 216 | SECTION 02614 | .A No comment. T.CI.PJK.074 | No resolution required. |
| 217 | SECTION 02615 | .A 1.05 Paragraph 1.05 Quality Assurance Level shall be in accordance with ESF-QALAS 6.2.1-0001. T.CI.PJK.075 | Agree, will add in next submittal of Title II. |
| 218 | SECTION 02615 | 3.08 B Identify type of chemical-biological enzyme soil conditioner and proposed location of use. T.CI.THP.033 | Agree, will add in next submittal of Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 56

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------|--|--|
| 219 | SECTION 02615 | PAGE 12 3.08A Areas requiring dust control include muck haul road, muck storage area, borrow areas and topsoil storage areas. Indicate dust control methods for these areas. T.CI.THP.010 | We will indicate surface treatment areas and type of controls on the plans. |
| 220 | SECTION 02720 | 3.02.A Setting permanent signs in concrete without the provisions for a breakaway design is questionable. Investigate the AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaries, and Traffic Signals (1975). T.CI.MCB.011 | Agree. |
| 221 | SECTION 02730 | There is no criteria for encasement when in the proximity of potable water. Paragraph 3.03 states only where shown on the drawing. N.CI.PEP.060 | Agree. |
| 222 | SECTION 02730 | .A 1.05 Paragraph 1.05 Quality Assurance Level shall be in accordance with ESF-QALAS 6.2.2-0001. T.CI.PJK.076 | Agree, add in next submittal of Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 57

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--|---|--|
| 223 | SECTION 02730 3.05A | Paragraph 3.05A: This is not practicable. The bottom of a trench is essentially flat. N.CI.PEP.006 | Agree. |
| 224 | SECTION 02730 3.13 .D P.9 | Approval for operating the system will also be required from the Nevada Dept. of Health (N.R.S. Chapter 445). T.CI.THP.037 | Agree. Permitting is currently being accomplished by SAIC. |
| 225 | SECTION 02730 3.13.B.4 | Since fluids are being controlled on this project, define the provisions for monitoring this allowable leakage. T.CI.MCB.012 | H&N will reevaluate the testing requirements and resubmit in next submittal of Title II. |
| 226 | SECTION 02731 .A 1.05 | Paragraph 1.05 Quality Assurance Level of Systems shall be in accordance with ESF-QALAS 6.2.2-0001. T.CI.PJK.077 | Agree, add in next submittal of Title II. |
| 227 | SECTION 02731 A, 1.01 PAGE 2, 3.05 PAGE 5 | The wastewater lagoons are referred to as sewage lagoons in the specification, but this is incorrect. | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 58

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|---|
| | | <p>This lagoon will receive only industrial wastewater, and not any sewage. A sewage lagoon system would require an operating permit from the state of Nevada.</p> <p style="text-align: right;">R.CI.OLH.004</p> | |
| 228 | | <p>SECTION 02731 A, 1.04, PAGE 2 An operating permit from the state of Nevada will be required for the septic tank/leachfield system. The information necessary to obtain this permit should be added to the submittals.</p> <p style="text-align: right;">R.CI.OLH.001</p> | <p>There are no submittals required. The permitting is being accomplished by SAIC.</p> |
| 229 | | <p>SECTION 02731 A, PART 3 No mention is made of the manner in which sewage pumped from underground toilets will be disposed of. I recommend that the material be pumped into a portable tank underground, which can then be brought to the surface. This tank should then be somehow connected or pumped into the septic tank system for disposal. Some sort of receiving port or connection should be built into the system for quick, easy disposal.</p> <p style="text-align: right;">R.CI.OLH.005</p> | <p>F&S providing methods for underground waste removal. H&N will modify sanitary appurtances to accommodate F&S design.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 59

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------------------------|---|---|
| 230 | SECTION 02731 PAGE 5 3.05A | This section refers to "sewage lagoons shown on drawings". The drawings do not show a sewage lagoon. Clarify discrepancies between specification and drawing. T.CI.THP.011 | Agree, this will be done in next submittal of Title II. |
| 231 | SECTION 02740 .A 1.05 | Paragraph 1.05 Quality Assurance Level of System shall be in accordance with ESF-QALAS 6.2.2-0001. T.CI.PJK.079 | Agree, will add in next submittal of Title II. |
| 232 | SECTION 02831 | Recommend that DOE Standard Specifications, 1980, be reviewed. The H&N Spec. does not contain all the technical information. N.CI.PEP.007 | Agree. |
| 233 | SECTION 02831 .A 1.05 | Paragraph 1.05 Quality Assurance Level of fences shall be in accordance with ESF-QALAS 6.2.1-0001. T.CI.PJK.078 | Agree, will add in next submittal of Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Civil

Page 60

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--------------------------------|---|--|
| 234 | SECTION 02831 PAGE 8, 3.04B.1. | Specifications state, " See drawings for wire spacing requirements." Indicate drawings showing fence wire spacing requirements. T.CI.THP.015 | The drawing will reference the specifications. |
| 235 | SECTION 02831 PART 1, 1.03B | Include Bureau of Land Management fencing requirements. T.CI.THP.014 | Will be considered for incorporation in Title II. |
| 236 | SECTION 02990 | Recommend that DOE/NV Standard Specifications, 1980, be used as a guide for technical requirements. N.CI.PEP.008 | Agree. |
| 237 | SECTION 02990 .A 1.05 | Paragraph 1.05 Quality Assurance Level of Systems shall be in accordance with ESF-QALAS 6.2.2-0007 and 6.3.1-0004. T.CI.PJK.080 | Agree, will be incorporated in next submittal of Title II. |

o COMPLIANCE TO 10 CFR 60 REQUIREMENTS

No issues that could impact future licensing considerations were identified during the review. The reviewing organizations determined that the ESF designs either complied with the 10 CFR 60, regulation or would comply with the regulation once the agreed upon action had been completed, see Section 7.0, Volume 2, "10 CFR 60 Compliance Review" of this memorandum for expanded detail including workshops.

o EXPECTED ENGINEERING CHANGE REQUESTS (ECRs)

- Comment No. 19 - F&S Mining

FS-GA-0160

An ECR will need to be submitted by Los Alamos to modify drift geometry for the separation between the vertical waste package drifts and the horizontal and vertical drifts to allow drilling and instrumentation operations.

- Comment No. 61 F&S Mining

FS-GA-0166 PLAN

Meets current requirements of SDRD, but will need modification to reflect ECR in process for changes in drift sizing, spacing, computer and IDS alcoves.

- Comment No. 170 H&N Civil

JS-025-ESF-C46 H&N

An unincorporated comment from ESF Title I, 50 Percent Design Review was to incorporate designs criteria to minimize harm to floodplains (DOE General Design Criteria, 6430.1A 0185.3.2.5) (Executive Order 11988, Floodplain Management). This ECR will be prepared and submitted by H&N.

- Comment No. 6 F&S General

GENERAL F&S

The General Arrangement Drawing FS-GA-0160 has drifts not found in the Appendix A of the SDRD as well as major changes to arrangements such as shaft station excavations. F&S agrees ECRs will be submitted to reflect consensus' reached at 50 Percent Review and in subsequent meetings with SNL and other Project participants.

o COMMENTS IN DISPUTE

The following comments have not been resolved to the satisfaction of the reviewers and are shown below:

- H&N and F&S General GE-053 by D. STUCKER, Reference: Q.GE.DS.002
- H&N Civil CI-154 by P. PHILLIPS, Reference: N.CI.PEP.028

Concerning placement of QA Level and QALA references on drawings, the following are in dispute:

- H&N General GE-006 by M. FOX, Reference: R.GE.MAF.010
- H&N General GE-007 by M. FOX, Reference: R.GE.MAF.015
- F&S General GE-010 by M. FOX, Reference: R.GE.MAF.011

The process for conclusion of a disputed comment resolution requires the reviewer to present his concerns in writing to the next higher level of project authority for a decision.

o COMMENT RESOLUTION CONCURRENCE

The review team lead representatives concurred with all of the resolutions developed for all of the comments submitted by his/her organization during the design comment and resolution activities, except for the comments shown above in "Comments in Dispute."

o NOTE

The approved resolution for F&S Civil Comment 66 is incorrect. Replace the word "Mining" with "Civil" in the resolution statement.

COMMENT RESOLUTION SHEET

Page 1

NES0101
7/88

Document Originator H&N
Date 8/8/88
Document Title ESF 100% Technical Review
Title I
Architectural
Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson [Signature] Date 9/15/88
QA [Signature] Date 9/15/88
A/E [Signature] Date 9/15/88
WMPO [Signature] Date 9/16/88

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-----------------------------------|------|---------------------|------------|
| See Page 2 for start of comments. | | | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Architectural

Page 2

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

1 JS-025-ESF-A1 .A
DOE orders require trailers to meet
DOE/EV 0043, Standard on Portable
Structures.

N.AR.PEP.029

Agree, trailers have been designed per DOE/EV-0043 requirements and all Title II details will also. Draft specifications will be available at 30% Title II.

2 JS-025-ESF-A1 A - DETAILS 19 & 20
In order to better meet REECO's
functional requirements, add two
additional enclosed offices at the north
end of each double wide trailer. In
addition, add three enclosed offices
along the west side of the double wide
trailer shown in Detail 19. REECO will
provide details to H&N via
transmittal.

R.AR.RRR.002

Can only add one office at north end of each trailer. Can add three offices in trailer #19.

3 JS-025-ESF-A1 A
General Notes, Note 8: Modify note to
read "Furnish all structural ...
usable buildings, and deliver all ...
components required."

C.AR.EOJ.022

All design criteria for portable facilities will be covered in the Title II project specifications and not be general notes on the drawings. This verbage will be used when writing the specification.

4 JS-025-6000-A1 B - FLOOR PLAN
Move the fenced storage area from the NW
corner to the SW corner of the building.
The reason is that the north side of the

Agree

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 3

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | shop will be the primary access for large equipment. The north side of the shop should be left open for ease of access and to provide as large a work area as possible. This comment also applies to Drawings JS-025-6000-M4.B/M5.B/M6.B/M7.B/FP1.B/FP2.B/E2.B/W1.B/. R.AR.RRR.003 | |
| 5 | | JS-025-6000-A1 B, M4.B-M7.B, FP1.B-FP2.B,E2.B, W1.B Comment R.A.DK.039 from the 50 Percent Title I Design Review has not been fully addressed. (Shop interior general arrangement) Specifically, the required amount of shop space has not been provided for. R.AR.DLK.021 | An ECR to change the shop requirements in the SDRD has been submitted by REECo. Upon resolution of this ECR by the ICWG, our Title II design package will be changed to reflect the resolution. The referenced ECR was withdrawn by REECo at the ICWG. The ECR will be resubmitted. |
| 6 | | JS-025-6000-A1 .B AND OTHERS The electric doors shown here and elsewhere must have a safety-stop strip on the bottom to stop the door if it hits anything. N.AR.PEP.041 | Agree, this is covered in the specifications. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 4

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-----------------------------|--|--|
| 7 | JS-025-6000-A1 B | Show location for storage for chemical and hazardous materials. T.AR.THP.024 | Agree, will be shown at 30% Title II. |
| 8 | JS-025-6000-A1 .B | SDRD criteria 1.2.6.3.7 Performance Criteria No. 4 requires a chemical storage area. The designated storage area is enclosed by woven wire partitions which would not meet OSHA regulation 29 CFR1910.106(d) requirements for liquid-tight construction, self-closing fire doors, and sufficient ventilation to provide 6 air changes per hour. The A/E should determine the quantity of flammable materials that may be required to be stored and allocate space for an inside storage room, if needed. T.AR.SWP.002 | The woven wire partition is for secure storage not chemical storage. H&N and REECO have not completed criteria development to identify the types and quantities of chemicals to be stored. This will dictate the location, size, and construction for the storage area and will be included in 30% Title II. |
| 9 | JS-025-6001-A1 .B GRID F-10 | Same as comment TAR SWP 002. T.AR.SWP.026 | See response to H&N Architectural comment No. 8. |
| 10 | JS-025-6001-A1 B | The 6001 building shown is not the same as shown on JS-025-6001-A2.A, etc. | Drawing 6001-A1 is the warehouse building submitted in the 50% Title I review. It is included here only to show compliance with 50% |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 5

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| | | This confusion needs to be cleared up. T.AR.SCS.024 | review comments. |
| 11 | | JS-025-6001-A1 .B AND A2.A We appear to have two different buildings, both warehouses and both shown as building 6001. Please clarify. N.AR.PEP.045 | Reference Note 16. Drawing 6001-A2 reflects an approved ECR submitted after the 50% review. It will be the warehouse developed in Title II. Drawing 6001-A1 will be eliminated in Title II. See previous reply. H&N Architectural comment No. 10. |
| 12 | | JS-025-6001-A1 B This building, in addition to the building shown on H&N Drawing JS-025- 6000-A1.B, are both required in order to satisfy REECO's shop area requirements. R.AR.RRR.004 | An ECR to change the shop requirements in the SDRD has been submitted by REECO. Upon resolution of this ECR by the ICWG, our Title II design package will be changed to reflect this resolution. The referenced ECR was withdrawn by REECO at the ICWG. The ECR will be resubmitted. |
| 13 | | JS-025-6001-A2 A The dimensions of the warehouse building 6001 are shown to be 100 feet by 50 feet. Other reference drawings for this building show dimensions of 40 feet by 30 feet. Delete the drawings which are no longer applicable and replace with | See reply to H&N Architectural comment No. 10. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 6

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | the updated ones. K.AR.DW.004 | |
| 14 | | JS-025-6001-A2 A The warehouse shown on H&N Drawing JS-025-6001-A2.A will satisfy REECO's currently identified warehousing requirements. Use this warehouse concept for Title II design. R.AR.RRR.016 | Agree |
| 15 | | JS-025-6001-A2 .A Indicate location of chemical storage area (SDRD 1.2.6.3.7 Performance Criteria #4). T.AR.THP.036 | H&N and REECO have not completed criteria development to identify the types and quantities of chemicals to be stored. This will dictate the location, size, and construction for the storage area and will be included in 30% Title II. |
| 16 | | JS-025-6001-A2 A Clearly define OS&D storage. T.AR.SCS.025 | This is storage for items received that are "Over, Short, or Damaged". This will be defined on the Title II drawings. |
| 17 | | JS-025-6001-A2 A General Note #4 should also state that the electrically operated roll-up doors will have a safety stop device as required by the NTS Construction Specifications, paragraph 9.4.2.2. R.AR.JLB.006 | Safety stop is covered by specifications. Section 08330.A para. 2.03.C.5. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 7

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--------------------------|--|---|
| 18 | JS-025-6001-A2 A | <p>Reverse the north arrow so that the loading dock side of the warehouse is facing in a northerly direction. This drawing will then be in agreement with the warehouse orientation as shown on H&N Drawing JS-025-ESF-C40.B</p> <p>Add a second large door on the side of the warehouse opposite from the loading dock in order to accommodate access of a forklift. This change will eliminate the need for the ramp at the loading dock. This change was proposed by H&N and REECO agrees with it.</p> <p style="text-align: right;">R.AR.RRR.005</p> | <p>North arrow direction will be revised to agree with the civil drawing.</p> <p>Agree, the doors will be added and the ramp deleted in Title II.</p> <p>Agree, when the entire complex is shown at 30% Title II gates will be shown.</p> |
| 19 | JS-025-6001-A2 A | <p>A gate or door must be installed in the chain link fence located on the east side of the building so emergency exiting away from the building will be possible in accordance with Section 5-7.1 of NFPA 101 (Life Safety Code).</p> <p style="text-align: right;">R.AR.JLB.005</p> | |
| 20 | JS-025-6001-A2 AND A3 | <p>Clarify different warehouse configuration identified on these</p> | <p>See response to H&N Architectural comment No. 10.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 8

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|--|
| | | <p>drawings in comparison to warehouse identified on drawings JS-025-6001-A1, M1, M2, FP1, FP2, E1 and W1 (Drawing JS-025-ESF-C4 identifies former warehouse as "unassigned bldg."). T.AR.RLT.004</p> | |
| 21 | | <p>JS-025-6001-A3 A The dimensions of the warehouse building 6001 are shown to be 100 feet by 50 feet. Other reference drawings for this building show dimensions of 40 feet by 30 feet. Delete the drawings which are no longer applicable and replace with the updated ones. K.AR.DW.005</p> | <p>See response to H&N Architectural comment No. 10.</p> |
| 22 | | <p>JS-025-6001-A3 A WAREHOUSE BUILDING 6001 SECTIONS AND ELEVATIONS</p> <p>The loading dock on the south elevation view measures to be four feet to ground level. It is required by 1910.23 (c) (1) that open-sided floors/platforms that are 4 feet or more above the adjacent floor or ground level shall be guarded by standard railing. It is recommended tht a</p> | <p>Agree, will add in the next submittal of Title II.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 9

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| | | removable railing system be developed and installed at this location to comply with the existing standard. R.AR.FAS.012 | |
| 23 | | JS-025-6001-A3 .A Double wide storage racks over 12' high are shown. NFPA 231 will apply. If the building is as depicted, the fire protection drawings will require revision. N.AR.PEP.046 | Height of storage racks will be identified and if over 12' high, fire protection drawings will follow NFPA 231 requirements. |
| 24 | | JS-025-6002-A1 A Separate the two hoist areas by a one-hour fire wall and separate the resistor banks from the hoists with a one-hour fire wall as recommended by the ESF Life Safety/Fire Protection Subcommittee. Any penetrations of these fire walls would have to be protected by fire doors, fire windows, fire dampers, etc. R.AR.JLB.007 | The 12" CMU wall separating the hoists is a 1 hour rated fire wall. There is not to be a wall separating the hoists from the resistor banks. The subcommittee report will be reviewed and the resistor bank problem will be reconsidered. |
| 25 | | JS-025-6002-A1 .A The criteria for the wall around hoist #1 is that it was to be a fire wall, floor to roof with UL/FM labeled fire | The 12" CMU wall will be detailed in Title II to be a 1 hour rated fire wall separation. The fire door or any penetration will be one hour or better rated. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 10

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | doors and fire rated penetration seals. This is not shown on the drawing. N.AR.PEP.047 | |
| 26 | | JS-025-6002-A1 A Provide sumps in electrical trenches to remove water. R.AR.LJF.014 | Agree, a sump pit will be added in the next submittal of Title II. |
| 27 | | JS-025-6002-A1 A General Notes, Note 2: Rewrite note to read, "... metal buildings. Furnish all structural calculations... to assemble all components. All drawings..." C.AR.EOJ.008 | All building requirements will be handled via the specifications in Title II. Okay as is. |
| 28 | | JS-025-6002-A1 A, A2.A The above drawings should agree with FS-GA-0016 and FS-GA-0034 that show temporary building enclosures for the stage hoists for ES-1 and ES-2 sinking. R.AR.DLK.012 | Exact criteria for the stage hoists enclosures will be defined and shown at 30% Title II. |
| 29 | | JS-025-6002-A1 .A General Note 10 specifies, "Quality Level will be noted when ESF Quality | Agree |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 11

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|---|
| | | <p>Assurance Level assignment sheets are issued". Unless actual quality levels are going to be referenced on H&N drawings, the note should read, "ESF Quality Assurance Level assignment sheets will be referenced when issued". This deficiency also applies to JS-025-6004-A1B and to JS-025-6007-A1B. F.AR.JAJ.024</p> | |
| 30 | | <p>JS-025-6002-A2 A Reference 30 CFR Sections 57.14036 and 57.11001</p> <p>Drawings do not depict a removable roof of hoist house. Two overhead rail mounted cranes should be utilized to facilitate the removal of large parts and components of the hoists and electrical gear. M.AR.PT.004</p> | <p>Disagree, if a portion of the roof should require removal it can be easily done with pre-engineered metal building panels, to provide access for suitable lifting equipment with proper communication systems.</p> |
| 31 | | <p>JS-025-6006-A1 B Title: Surface Data Building 6006 Floor Plan & General Notes</p> <p>Indicate in General Notes that the records vault door will be fire rated greater than or equal to the two-hour</p> | <p>All door requirements will be handled via a door schedule at 30% Title II.</p> |

REVIEWER'S COMMENT CONTINUATION SHEETNES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 12

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | fire rated walls. T.AR.JMD.002 | |
| 32 | | JS-025-6006-A1 B General Note #4 should also state that fire doors will be installed in the Computer Room and Records Vault fire separations. R.AR.JLB.008 | All door requirements will be handled via a door schedule at 30% Title II. |
| 33 | | JS-025-6006-A1 .B The computer room fire wall is shown with glass windows. It will be necessary to identify that the entire wall and all its components can be assembled to meet DOE/EP-0108 floor to roof. Requirements including details as to how the wall will fit around roof supports. N.AR.PEP.049 | At 60% Title II all wall/door/window details will insure the integrity of a 1 hour rated wall assembly. |
| 34 | | JS-025-6006-A2 A "raised floor" was specified for the computer areas in the Surface Data Building. A "sunken floor" is not acceptable due to possibilities of water pooling of rain runoff or water leaks inside the building. A.AR.TJM.015 | H&N will reinvestigate the IDS building design and provide adequate analysis if the sunken floor is needed. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 13

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------------|---|--|
| 35 | JS-025-6006-A1 B | General Notes, Note 2: Re-edit note to read as follows, "... pre-engineered Metal Buildings. Furnish all structural calculations ... to assemble all components. All drawings shall indicate..." C.AR.EOJ.009 | All building requirements will be handled via the specifications in Title II. Okay as is. |
| 36 | JS-025-6006-A2 A | The sunken floor in the computer area should be justified. As is, the area under the computers will act as a drain for any water in the building. This is especially important because there are wet sprinklers used in the fire protection system. J.AR.RDE.003 | H&N will reinvestigate the IDS building design and provide adequate analysis if the sunken floor is needed. |
| 37 | JS-025-6007-A1 .B | The IDS subsurface Data Building may require a second exit from the IDS Console Room and Workstation Room to meet fire codes. A.AR.TJM.008 | Only one exit required per code but will add a door in the glass partition wall for ease of use. |
| 38 | JS-025-6007-A1 .B | Correct General Note 3. The computer floor must meet DOE/EP-0108. Wood | Note 3 only calls for vinyl floor covering. Computer floor panels are covered in the specifications and call for all metal |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 14

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|--|
| | | <p>core metal encased panels are not acceptable.</p> <p style="text-align: right;">N.AR.PEP.052</p> | <p>panels. Okay as is.</p> |
| 39 | | <p>JS-025-6008-A1 A CHANGE HOUSE BUILDING 6008 FLOOR PLAN & GENERAL NOTES</p> <p>Presently shown in the lamp room is an eye wash station that is there because of the battery charging station also located in this room. To comply with OSHA 1926.441 standard, a shower must be installed within 25 feet of a battery charging station.</p> <p style="text-align: right;">R.AR.FAS.003</p> | <p>Agree, the face and eye wash station will be upgraded to a shower with a face and eye wash station.</p> |
| 40 | | <p>JS-025-6008-A1 A Comment R.A.DK.048 from the 50 Percent Title I Design Review has not been fully addressed. (Service building combined facilities) Specifically, no provision has been made in the change house building for the following:</p> <ul style="list-style-type: none"> o female craft labor lockers o scientific user lockers - male and female | <p>Agree, H&N will review design to include occupancy by male and female craft laborers, visitors and PIs if required.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 15

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | <p>o shower and toilet facilities for craft and scientific females</p> <p>In addition to the above, make allowance for future expansion of the changehouse.</p> <p>R.AR.DLK.020</p> | |
| 41 | | <p>JS-025-6008-A1 A</p> <p>Show what change house arrangements are being considered for female workers. If no arrangements are being considered in this building, add a drawing of the proposed facility.</p> <p>K.AR.DW.002</p> | <p>See response to comment 40. Agree, H&N will review design to include occupancy by male and female craft laborers, visitors and PI if required.</p> |
| 42 | | <p>JS-025-6008-A1 A</p> <p>Show what change house arrangements are being considered for female visitors. If a separate facility is being considered, add a drawing of proposed facility.</p> <p>K.AR.DW.003</p> | <p>See response to comment 40. Agree, H&N will review design to include occupancy by male & female craft laborers, visitors and PI if required.</p> |
| 43 | | <p>JS-025-6008-A1 A</p> <p>Provide area for womens facility to accomodate expected woman visitors and experimentors.</p> | <p>See response to comment 40. Agree, H&N will review design to include occupancy by male and female craft laborers, visitors and PI if required.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 16

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

T.AR.SCS.033

- 44 JS-025-6008-A1 A
It is recommended that a wall be constructed to separate the Life Safety and Fire Control Room from the Walker area. This would help control dust exposure to sensitive electrical equipment in the Life Safety and Fire Control Room.

R.AR.JLB.011

- 45 JS-025-6008-A1 .A
If the Life Safety and Fire Control is the main focal point of all critical systems at this location, it should be separated from other areas by a minimum 1 hour fire enclosure.

N.AR.PEP.054

- 46 JS-025-6008-A1 A
Due to the critical nature of the Life Safety and Fire Control Room, it is recommended that it be protected from external fire exposure by a one-hour fire rated wall. Any penetrations of this fire wall will require protection by fire doors, fire windows, fire dampers, etc.

It is our understanding that the walker needs to be immediately accessible to the Life Safety alarms. Additional evaluation/discussion with the Life Safety Subcommittee will determine if separation is advisable and if needed it will be added at 30% Title II.

Agree.

Agree.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural

Page 17

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|-------------------|---|--|
| 47 | JS-025-6008-A1 .A | There is insufficient information to evaluate requirements for the battery room. R.AR.JLB.010 N.AR.PEP.098 | Since it is a battery charging room, emergency equipment and adequate ventilation is provided. Agree. No calculations have been performed for hydrogen outgassing, as the brand and type of battery is unknown. A grille will be provided in door for natural ventilation in next submittal of Title II. |
| 48 | JS-025-6008-A1 A | General Notes, Note 1: Rewrite Note 2 to read, "... pre-engineered Metal Buildings. Furnish all structural ... to assemble all components. All drawings. C.AR.EOJ.017 | This will be included as part of the specifications during Title II. |
| 49 | JS-025-058-1-A1 A | Title: Office Trailer - Type A Floor Plan | The office space required to accommodate the NRC inspector is provided in the 330 sq. ft. in the A&E building. The office in this trailer was to provide an on-site work area in addition to the space in the A&E building. |
| | | This floor plan, as it would apply to Trailer 7, does not meet all of the requirements for NRC office space as stated in 10 CFR 60.75(c)(2). The offices that do provide the visual and acoustical privacy required do not meet the space requirement (250 sq. ft.) and | |

REVIEWER'S COMMENT CONTINUATION SHEETNES0102
7/88

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**

Name of Reviewer **H&N Architectural**

Page 18

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------------------|---|---|
| 50 | JS-025-058-2-A1 .A H-3 | <p>the office area that meets the requirements does not offer the visual and acoustical privacy required. Suggest adding a note to this drawing explaining that in Trailer 7 the wall separating the two offices in the southern end of the trailer will be removed, only one door will be installed, and this area will serve as office space for NRC.</p> <p style="text-align: right;">T.AR.JMD.003</p> <p>QALAS 6.3.1-0001 should be referenced.</p> <p style="text-align: right;">T.AR.FJK.012</p> | <p>QALAS references are on Drawing JS-025-ESF-A1.A under General Note 12.</p> |

COMMENT RESOLUTION SHEET

Page 1

NES0101
7/88

Document Originator H&N

Date 8/8/88

Document Title ESF 100% Technical Review

Title I

Architectural/Structural

Coordinator

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson [Signature] Date 9/15/88

QA [Signature] Date 9/15/88

A/E [Signature] Date 9/15/88

WMPO [Signature] Date 9/16/88

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 2

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------|---|---|
| 1 | SECTION 03001 | .1, 05120.A, 05210.A, 13121.A Paragraph 1.05 Quality Assurance Level shall be in accordance with the applicable ESF-QALAS. T.AS.PJK.081 | Agree. |
| 2 | SECTION 03001 | 1.04.A Shop drawings are not normally required for reinforcing steel. Rebar details or certifications may be required. T.AS.MCB.013 | Will clarify in Title II. |
| 3 | SECTION 03001 | 3.04.B Concrete is normally "placed" not "poured." T.AS.MCB.014 | Will change "poured" to "placed" which matches verbage on the rest of specifications. |
| 4 | SECTION 03001 | PLAIN AND REINFORCED CONCRETE Suggest that an approved source and standard mix for surface concrete be identified. It is unlikely that on-site concrete will be available for surface work. T.AS.IRC.017 | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural

Page 3

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

5 SECTION 04000 1.04.A
Shop drawings are not normally required for reinforcing steel. Rebar details or certifications may be required.
T.AS.MCB.016

Will rewrite to clarify required submittals in Title II.

6 SECTION 04000 .A PARA. 1.05
This paragraph states that quality assurance is not used. Furthermore, the specification does not include quality control or inspection. Paragraphs on both quality assurance and quality control should be included in this specification to cover activities related to QA requirements and testing.
F.AS.JAJ.025

Agree, will add in Title II.

7 SECTION 05120 05210.A
1.05 "Quality Assurance" - Specification incorporates items that belong in "FABRICATION" or "ERECTION" portions of the specification. Revise as appropriate.

Agree, we will revise for the next submittal in Title II.

R.AS.LGC.029

8 SECTION 05120 AND 05210.A
3.01 "EXAMINATION" - Change title to "EXAMINATION OF EXISTING CONDITIONS".

Agree, will revise for the next submittal in

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural

Page 4

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | R.AS.LGC.042 | Title II. |
| 9 | | SECTION 05120 .A A section covering Quality Control/Inspection should be added. This comment also applies to the following specs: Section 05210.A, 05300.A, 07200.A, 07465.A, 08800.A, 11180.A, 13121.A, 02211.A, 02222.A, 02500.A, 02556.A, 02614.A, 02720.A | Agree. |
| | | F.AS.JAJ.029 | |
| 10 | | SECTION 05300 1.05 "QUALITY ASSURANCE" - Subparagraph A addresses design and fabrication requirements rather than QA methods of verifying that fabrication, installation, etc. meet the requirements. | Agree, will revise for the next submittal in Title II. |
| | | R.AS.LGC.030 | |
| 11 | | SECTION 05400 3.01 INSPECTION Change title to "EXAMINATION OF EXISTING CONDITIONS" to be consistent with other specifications. | Agree, will revise for the next submittal in Title II. |
| | | R.AS.LGC.031 | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural

Page 5

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------|---|--|
| 12 | SECTION 07175 | 3.01, 3.02, 3.03, P.4 Subparagraph A of 3.01 is duplicated in 3.03A but the latter is more specific. Delete 3.01A. 3.03 B and C should be moved to 3.02. Method of testing for moisture content should be specified. R.AS.LGC.032 | Agree, will revise the paragraphs prior to next submittal in Title II and add method for testing. |
| 13 | SECTION 07200 | Paragraph 1.03: Should be revised to cite DOE Orders 6430.1A and 5480.1B. The Factory Mutual Approval Guide should also be cited. This applies to many other specifications sections too. N.AS.PEP.009 | Will add FM guide. DOE orders are not standards for material testing and should not be referenced in construction specifications. Will conform to DOE Order 6430.1A and 5480.1B in the next submittal for Title II. |
| 14 | SECTION 07200 | A, PART 1.03(A) Factory Mutual (FM) should also be listed under "References". Both the FM Approval Guide and FM Data Sheet 1-57 are applicable references for the use of foamed plastic insulation. R.AS.JLB.017 | Agree, will add in the next submittal for Title II. |
| 15 | SECTION 07200 | 1.05 The requirement of UL/FM label showing proper characteristics is a part of QA. | Agree, will add in Title II for labeled products prior to the next submittal. |

REVIEWER'S COMMENT CONTINUATION SHEETNES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural

Page 6

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------------------------------|---|--|
| | | N.AS.PEP.061 | |
| 16 | SECTION 07200 PAGE 3, 1.05 | In subparagraph A, minimum years of experience should be indicated. Subparagraphs B through C are more appropriate for Part 3 "EXECUTION" than for "QUALITY ASSURANCE". R.AS.LGC.033 | Agree, will add requirement for 3 years experience in next submittal for Title II. |
| 17 | SECTION 07200 2.02 | All these materials used inside a building, must meet DOE Orders 6430.1A and 5480. Generally, this will mean UL/FM labeled with flame spread not over 25. Paper faced insulation would, generally, be excluded and rigid foam would have additional requirements. N.AS.PEP.062 | UBC Standard No. 42-1 will be referenced for testing insulation meeting <25 flame spread and <450 smoke developed (per UBC). Rigid foam will only be used as exterior perimeter insulation for concrete slabs. |
| 18 | SECTION 07200 A, PARTS 2.02(C)&(I) | It should be specified that the use of foamed plastics must be in accordance with FM Data Sheet 1-57 "Rigid Foamed Polyurethane". This is a mandatory requirement per DOE Order 6430.1A. R.AS.JLB.018 | Agree, will also add <75 flame spread and <450 smoke developed per UBC Standard #42-1. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 7

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural,

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--------------------------------|---|--|
| 19 | SECTION 07200 3.02 | Metal deck roofs, with insulation above, must meet FM Class I metal deck roof designs. N.AS.FEP.063 | Does not apply. There are no buildings using metal decks with rigid insulation in this project. |
| 20 | SECTION 07465 2.01, PAGE 3 | Acceptable manufacturers listed in A,B, and C are not acceptable. Products acceptable should be specified instead since manufacturers often make different kinds of products. As written, subparagraph D providing for substitutions has no basis for comparison. R.AS.LGC.034 | Agree, will add product name to corresponding manufacturer in the next submittal for Title II, as stated in the specification approval is per DOE/COR. |
| 21 | SECTION 07465 A, PART 2.02 (J) | It cannot be verified that UL Guide Specification Test NYVQ is a current and/or applicable test for determining flame spread, fuel contributed and smoke developed ratings. R.AS.JLB.019 | Entire paragraph will be deleted in Title II as this test is not required for a noncombustible metal panel. |
| 22 | SECTION 07631 AND 07900.A 3.01 | Same comments as for 05120 and 05210. R.AS.LGC.035 | Agree, will change in the next submittal for Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural

Page 8

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | |
|----------------|--|---|--|
| | | RESOLUTION | |
| 23 | SECTION 07900 A, PART 1.03 The Underwriter's Laboratories (U.L.) Building Materials Directory and Factory Mutual FM Approval Guide should also be listed under "References." R.AS.JLB.020 | Agree, will add in the next submittal for Title II to reference testing required for fire rated caulks. | |
| 24 | SECTION 07900 A, PART 2.01(I) It should also be specified that the fire stop sealant used must be U.L. listed or FM approved and provide fire resistive rating equal to or greater than the fire resistive separation which was penetrated. R.AS.JLB.021 | Agree, will add in the next submittal for Title II to require the fire rated caulks be tested and labeled by nationally accredited laboratory. | |
| 25 | SECTION 08100 A, PART 1.03 The Factory Mutual (FM) Approval Guide should also be listed under "References". R.AS.JLB.022 | Agree, will add in the next submittal for Title II. | |
| 26 | SECTION 08100 Paragraph 1.03: Add the Factory Material FM Approval Guide. N.AS.PEP.010 | Agree, will add the Factory Mutual Approval Guide in the next submittal for Title II. | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 9

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------------------------|---|---|
| 27 | SECTION 08100 1.03 | Add the UL equipment lists. N.AS.PEP.064 | Agree, will add in the next submittal for Title II. |
| 28 | SECTION 08100 1.03 | Add Warnock Hersey Fire Laboratory Listing. N.AS.PEP.065 | Agree, will add in the next submittal for Title II. |
| 29 | SECTION 08100 1.05B4 | Oversized doors must be certified by a nationally recognized testing laboratory as being built in the same manner as a labeled fire door. N.AS.PEP.066 | Agree, will delete paragraph 1.05B4. |
| 30 | SECTION 08100 A, PART 1.06(A) | NFPA 80 is the applicable code for fire-rated frames and doors and should be specified. R.AS.JLB.023 | Agree. |
| 31 | SECTION 08100 2.01 | 08330.A, 08500.A, 08700.A, 08800.A, 09111.A, 09260.A, 09310.A, 09511.A, 09650.A, 09686.A, 09900.A, 10160.A, 10605.A, 10800.A, 13121.A, Acceptable Manufacturers. Same comment as for 07465.A. | Agree, will add product name to corresponding manufacturer in the next submittal for Title II as stated in the specification approval is per DOE/COR. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural

Page 10

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|--|
| | | R.AS.LGC.036 | |
| 32 | | SECTION 08100 A, PART 2.01(A)&(B) It should be clarified that these are not acceptable manufacturers of fire doors and frames because their products are not U.L. listed or FM approved. R.AS.JLB.024 | H&N will insure that cited manufacturers make fire rated door assemblies approved by a nationally accredited testing laboratory in the next submittal of Title II. |
| 33 | | SECTION 08330 Paragraph 2.02D: This is inadequate to describe a safety-stop device on the bottom of a door to halt movement when it hits an object. N.AS.PEP.011 | Disagree safety stop is covered under paragraph 2.03.C.5. |
| 34 | | SECTION 08100 2.03A It is doubtful that any fire door will ever have a polyurethane core. N.AS.PEP.067 | Agree, will rewrite in Title II to clarify requirements for fire rated doors versus regular doors. |
| 35 | | SECTION 08330 2.03C5 Paragraph 2.03C5 is acceptable. N.AS.PEP.068 | Agree. |
| 36 | | SECTION 08500 A There should be a "Regulatory Requirements" section added which states that fire window frames must be | Agree, will add the requirements for assemblies to be rated by a nationally accredited laboratory and be installed per NFPA 80 in the next submittal for Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural

Page 11

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|--|
| | | U.L. listed or FM approved and installed in accordance with NFPA 80. R.AS.JLB.027 | |
| 37 | | SECTION 08500 A, PART 1.03 The Underwriter's Laboratories (UL) Building Materials Directory and Factory Mutual (FM) Approval Guide should also be listed under "References" because fire window frames must be U.L. listed or FM approved. R.AS.JLB.025 | Agree, will add in the next submittal for Title II to reference testing requirements. |
| 38 | | SECTION 08500 This specification is not adequate to describe windows in any fire rated wall or assembly. N.AS.PEP.012 | Agree, in Title II will separate fire rated window requirements for clarity. |
| 39 | | SECTION 08500 A, PARTS 2.01(A)&(B) It should be clarified that these are not acceptable manufacturers of fire windows because they are not U.L. listed or FM approved. R.AS.JLB.026 | H&N will insure that cited manufacturers make fire rated window assemblies approved by a nationally accredited testing laboratory in the next submittal of Title II. |
| 40 | | SECTION 08500 2.03 If aluminum frames are required, do not bother specifying fire- rated glass. | Agree, aluminum frames not allowed per UBC. Will revise in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural

Page 12

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

This must be revised.

N.AS.PEP.069

41 SECTION 08700 A, PART 1.03
The Factory Mutual (FM) Approval Guide
should also be listed under
"References".

R.AS.JLB.028

42 SECTION 08700 A, PART 2.06(A)
It should be specified that exit devices
and accessories must also conform to
NFPA 101 (Life Safety Code).

R.AS.JLB.029

43 SECTION 08700
All fire doors must have UL or FM listed
and labeled fire door hardware.
Listing must be in accordance with fire
door requirements.

N.AS.PEP.013

44 SECTION 08800 A
Glass and glazing for fire doors and
fire windows should be addressed in
these specifications.

R.AS.JLB.030

Agree, will add in the next submittal for
Title II.

Agree, will add in the next submittal for
Title II.

Will clarify in the next submittal of Title
II for fire rated hardware to be tested and
labeled by nationally recognized laboratory.

Agree, will clarify in the next submittal for
Title II.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 13

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Architectural/Structural

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

45 SECTION 09111
This spec. is not adequate to describe
fire wall design or installation.
N.AS.PEP.014

Agree. Fire wall designs will be detailed on
the drawings in the next submittal for Title
II.

46 SECTION 09260 A, PART 1.03(A)
ASTM E-84, "Standard Test Method for
Surface Burning Characteristics of
Building Materials", should also be
listed.
R.AS.JLB.032

Agree, will be added in the next submittal
for Title II.

47 SECTION 09260 A, PART 1.03
Factory Mutual should also be listed
under "References".
R.AS.JLB.031

Agree, will be added in the next submittal
for Title II.

48 SECTION 09260 1.03
Paragraph 1.03: Add FM Approval Guide.
N.AS.PEP.070

Agree, will be added in the next submittal
for Title II.

49 SECTION 09260 1.03G
Add UL Equipment Lists.
N.AS.PEP.071

Agree, will be added in the next submittal
for Title II.

50 SECTION 09260 1.06
Paragraph 1.06: They must also conform
to DOE Order 6430.1A.
N.AS.PEP.072

Agree, will conform to DOE Order 6430.1A in
the next submittal for Title II.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Architectural/Structural

Page 14

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--|---|--|
| 51 | SECTION 09260 | Paragraph 1.03: Add DOE orders 6430.1A and 5480.1B. N.AS.PEP.015 | Disagree, DOE orders are not standards for material testing and should not be referenced in construction specifications. Will conform to DOE Order 6430.1A in the next submittal for Title II. |
| 52 | SECTION 09260 A, PART 2.02(E)(2) It should also be specified that the fire retardant wallboard must be U.L. listed or FM approved with a flame spread rating of 25 or less and a smoke developed rating of 50 or less per ASTM E-84. | R.AS.JLB.033 | H&N will specify for Type "X" fire rated gyp board to be approved by a nationally accredited testing lab and will list UL fire assembly test numbers for the next submittal in Title II. |
| 53 | SECTION 09260 2.02 The material must be UL/FM labeled and firewalls must be assembled in accordance with listed design. | N.AS.PEP.073 | Agree, UL assembly designs will be detailed on the drawings in the next submittal for Title II. Material testing and labeling will be clarified. |
| 54 | SECTION 09511 Paragraph 1.03: Add FM Approval Guide. | N.AS.PEP.016 | Agree, will add in Title II. |
| 55 | SECTION 09511 1.06 There are additional restrictions on ceiling tile, if we wish to exclude requiring sprinklers above the ceiling. | | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 15

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Architectural/Structural

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | N.AS.PEP.074 | |
| 56 | | SECTION 09650 Paragraph 1.06: I doubt that you will find much floor covering that has been tested to this criteria. This is not a DOE requirement. | Agree, will delete in Title II. |
| | | N.AS.PEP.017 | |
| 57 | | SECTION 09686 A, PART 1.03 The DOE/NV carpet requirements should be listed under "References" since it is the governing document on fire protection requirements for carpet. | Disagree to referencing DOE documents or DOE standards on the specifications and drawings. |
| | | R.AS.JLB.034 | |
| 58 | | SECTION 09686 Paragraph 1.03E: There is no UL listed carpet that will meet the criteria. We will accept any nationally recognized testing laboratory. | Agree, will revise in Title II. |
| | | N.AS.PEP.018 | |
| 59 | | SECTION 09686 1.04D This is incorrect. See DOE/NV Manager's letter of June 12, 1984. | The DOE/NV carpet requirement is for NVO and has not been specified for this project. If DOE/Project Office imposes this on H&N, it will be conformed with. |
| | | N.AS.PEP.075 | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 16

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Architectural/Structural

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

60 SECTION 09686 A, PART 1.07
Correct to read that the carpet flammability requirements must comply with DOE/NV carpet criteria. Since only one carpet manufacturer is U.L. listed, it is recommended that it be specified that the carpet must be tested by a nationally recognized lab (U.S. Testing, Southwest Research, Commercial Testing, etc.)

R.AS.JLB.035

61 SECTION 09686 1.07
This is incorrect. Must conform to DOE/NV Manager's letter of June 12, 1984.

N.AS.PEP.076

62 SECTION 09686 A, PART 2.02(F)(6)
According to the DOE/NV carpet requirements, the flammability results listed here are only acceptable for a fully sprinkled, non-critical low value area. It is recommended that the DOE/NV carpet criteria be listed here.

R.AS.JLB.036

The DOE/NV carpet requirement is for NVO and has not been specified for this project. If DOE/Project Office imposes this on H&N, it will be conformed with. Instead of "UL" state "a nationally accredited testing laboratory."

The DOE/NV carpet requirement is for NVO and has not been specified for this project. If DOE/Project Office imposes this on H&N, it will be conformed with.

Refer to H&N Architectural/Structural comment #60.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 17

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Architectural/Structural

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------------------|--|--|
| 63 | SECTION 09686 2.02F6 | <p>The general criteria shown here is acceptable for any sprinklered facility without a critical occupancy (computer, etc.). To this we must add, "The carpet must be tested by a nationally recognized testing laboratory, installed in accordance with that test, and with a certification from the manufacturer that the carpet furnished is the same as that tested."</p> <p>Carpet, if any, in other areas must be flame spread not over 25 or critical radiant flux not less than 0.9 watts per sq. cm.</p> <p style="text-align: right;">N.AS.PEP.077</p> | <p>Agree. Will clarify in the next submittal for Title II.</p> |
| 64 | SECTION 10270 | <p>Access flooring must meet DOE/EP-0108. This means that access flooring must be totally noncombustible. Wood fill, treated or untreated, in a metal pan, is not acceptable.</p> <p style="text-align: right;">N.AS.PEP.019</p> | <p>Agree, paragraph 2.02.B1 will be clarified in the next submittal of Title II for total noncombustible construction.</p> |
| 65 | SECTION 13121 | <p>Foam sandwich panels, if any, must also conform to DOE order 6430.1A which</p> | <p>There are no foam sandwich panels proposed for this project.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 18

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Architectural/Structural

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

requires that they must be FM listed as
having passed the FM corner test
without requiring sprinklers.
N.AS.PEP.020

COMMENT RESOLUTION SHEET

Page 1

NEC-101
7/88

Document Originator H&N

Date 8/8/88

Document Title ESF 100% Technical Review

Title I

Mechanical

Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson [Signature]

Date 9/15/88

QA [Signature]

Date 9/15/88

A/E [Signature]

Date 9/15/88

WMPO [Signature]

Date 9/16/88

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 2

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|-------------------|---|---------------------------------|
| 1 | JS-025-ESF-FP1 B | <p>ABC portable fire extinguishers are shown at all DAS locations. It should be specified that these extinguishers be Halon 1211. The use of ABC dry chemical extinguishers on sensitive electronic equipment would result in costly clean up and probable damage to the equipment. This same comment also applies to drawings JS-025-ESF-FP2.B and JS-025-ESF-FP3.B.</p> <p>R.ME.JLB.001</p> | Agree, Halon 1211 was intended. |
| 2 | JS-025-ESF-FP1 .B | <p>ABC dry chemical extinguishers are not suitable for the locations shown. These appear to be small alcoves that will house instrumentation and data acquisition equipment, much like a computer room. An ABC dry chemical extinguisher should be prohibited in those locations. (See DOE/EP-0108 and NFPA 75.) Similar comments apply to JS-025-ESF-FP2.B and others. Dry chemical may be needed for MSHA compliance while mining, but cannot be used when occupied for scientific IDAS and similar purposes as it will destroy the electronic equipment.</p> | Agree, Halon 1211 was intended. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 3

COMMENT REVIEWER'S COMMENTS
NO. PAGE

RESOLUTION

N.ME.PEP.031

3 JS-025-ESF-FP1 B THRU FP4.B
General Note 4:

QALA No. 6.7.1-0014 not approved and
released; Replace with TBD.

R.ME.MAF.005

4 JS-025-ESF-FP3 B
There is a fueling area indicated on the
MTL; but it is not indicated if there
will be a storage tank at this level or
if refueling will be directly from a
surface tank. This information should
be included somewhere for comment.

R.ME.OLH.002

5 JS-025-ESF-FP3 12.B ZONE E-10
The location of the fueling station area
is not consistent with the current
F&S, Inc. Title I Design; i.e.: Drawing
FS-GA-0160.

R.ME.RRR.019

Agree.

Agree, the design of the fueling area and
fueling systems will be provided by F&S.
Fire protection system design will be based on
the F&S configuration. F&S has requested a
new configuration for the fueling area as
shown on Page 3 of F&S Engineering Change
Request #FS-ECR-009 on 07/15/88. H&N will
coordinate the design of the fire protection
system to whichever configuration F&S uses
in Title II design.

Agree, see comment #4.

NES0102
7/88

Page 4

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| 6 | | <p>JS-025-ESF-FP3 .B The fueling area should be located and designed for containment of all fuel spills (containment should include fuel from tanks and all lines). T.ME.THP.035</p> | <p>Agree, see comment #4.</p> |
| 7 | | <p>JS-025-ESF-FP3 B, C8 Identify Bulk Permeability Test area. G.ME.RWC.013</p> | <p>Disagree, this area has not been defined. Existing MTL Plan is based on Sandia Drawing No. R07048A/2 Revision 1 of 02/88.</p> |
| 8 | | <p>JS-025-ESF-FP3 .B Main Test Level Use of automatic sprinklers in main u/g test level. Where does this requirement come from. Has A/E considered potential impact on experiments and instrumentation systems if system is accidentally or purposely triggered. Suggest alternates be considered that are localized so that impact, if triggered, is minimized. S.ME.RES.001</p> | <p>The requirement for automatic sprinklers used in selected areas comes from DOE Order 5480.7 General Design criteria for automatic sprinkler system is given in DOE Order 6430.1A. The use of automatic sprinklers and it's impact on experiments and instrumentation systems has been discussed by the ESF Life Safety/Fire Protection Subcommittee. This subcommittee has published recommendations to DOE/YMPO for incorporation into the ESF design. For additional information please see H&N Conference Reports NNWSI:CR:88-037 (07/88) and NNWSI:CR:88-038 (07/88). H&N will reinvestigate water flow requirements with SNL and provide a preliminary design analysis by 30% Title II.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Mechanical

Page 5

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------------|---|---|
| 9 | JS-025-ESF-FP3 B | <p>Provision of extinguishers is excessive. Omit those units not located at site of possible conflagration (i.e., if not at DAS site of specific equipment/service site then remove unit. Extinguishers on mobile equipment will supplement stationary extinguisher units.</p> <p style="text-align: right;">T.ME.SCS.014</p> | <p>Disagree, as per DOE Order 6430.1A, extinguishers must be provided as per NFPA 10.</p> |
| 10 | JS-025-ESF-FP3 B | <p>The halon system needs to be called out in the MTL IDS building.</p> <p style="text-align: right;">J.ME.RDE.004</p> | <p>Disagree, keyed Note 5 reads "For fire protection inside IDS Building see sheet JS-025-6007-FP1. Protection shown is for alcove."</p> |
| 11 | JS-025-ESF-FP4 B | <p>Reduce number of extinguishers in the extension drifts to only those at specific equipment and service sites. Mobile equipment will carry sufficient extinguisher units.</p> <p style="text-align: right;">T.ME.SCS.015</p> | <p>Disagree, as per DOE Order 6430.1A, extinguishers must be provided as per NFPA 10.</p> |
| 12 | JS-025-ESF-FP4 B | <p>The black triangle symbols shown on the drawing every 150 feet do not correspond with the symbol denoting an ABC portable fire extinguisher, which</p> | <p>Agree, the reduction process made the symbols solid instead of a triangle with a square. The full size drawings show the symbol correctly.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 6

Name of Reviewer H&N Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| | | <p>is shown in keyed note #1. The symbol is also not shown on the Fire Protection Symbols and Abbreviations Drawing (JS-025-ESF-T3.A).</p> <p style="text-align: right;">R.ME.JLB.016</p> | |
| 13 | | <p>JS-025-ESF-FP4 B The key note No. 1 indicates the devices shown are fire extinguishers. Change the symbols to that shown on Drawing JS-025-ESF-T3.A to represent fire extinguishers.</p> <p style="text-align: right;">T.ME.JHM.003</p> | See comment #12. |
| 14 | | <p>JS-025-ESF-FP4 .B An "arrow" symbol is not shown on Drawing T3.A.</p> <p style="text-align: right;">N.ME.PEP.032</p> | See comment #12. |
| 15 | | <p>JS-025-ESF-FP5 .B Based on discussions in the Life Safety round table meeting 8/9/88, the requirements shown here do not satisfy the users or the standards. An ad hoc committee of users and experts should meet to discuss the overall problem. This may result in a change of criteria and a change in the SDRD documents.</p> | Disagree, however, will refer the problem to the Yucca Mountain Project Office for clarification. H&N does satisfy the needs. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Mechanical

Page 7

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS |
|----------------|------|---------------------|
|----------------|------|---------------------|

| RESOLUTION |
|------------|
|------------|

N.ME.PEP.033

- 16 JS-025-ESF-FP5 B
Some of the monitoring and control systems appear unnecessary for cost effective equipment operation. There is the likelihood that the monitoring and control systems themselves could shut down operating equipment and systems just for maintenance of the monitoring and control devices. Provide the safety and reliability analysis that justifies all of the detailed monitoring and control devices for power, ventilation, hoists, and compressors.

R.ME.DLK.008

- 17 JS-025-ESF-FP5 B - 11G
It is noted that several parameters are being monitored by the life safety and operations control. The workshop discussion indicated that the selection of monitored parameters are not necessarily supported by analysis. Because many of these systems are QA Level II it is recommended that the life safety and operations control be fully integrated with operational emergency

The types of items to be monitored and controlled are determined by F&S.

Agree.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 8

Name of Reviewer H&N Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | <p>response. Additionally, the system features must be supported by safety and reliability analysis. After the analyses are performed, the SDRD should be amended accordingly to document the basic conclusions developed by the analysis.</p> <p style="text-align: right;">T.ME.IRC.001</p> | |
| 18 | | <p>JS-025-ESF-FP5 B THRU FP13 B General Note 4:</p> <p>QALA No. 6.7.1-0010 not approved and released; Replace with TBD.</p> <p style="text-align: right;">R.ME.MAF.006</p> | Agree. |
| 19 | | <p>JS-025-ESF-FP6 B Indicate that alarm units not at DAS sites are at shaft experiment sites or omit alarm unit.</p> <p style="text-align: right;">T.ME.SCS.016</p> | Disagree, NFPA 72F requires that evacuation signals are clearly heard. Since personnel may be at various positions in ES-1 the entire shaft must have alarm speakers and strobes. |
| 20 | | <p>JS-025-ESF-FP6 .B We can recognize the symbols for the manual stations, the speaker horns and strobe, but we cannot identify the 4th symbol. It is not shown on referenced drawing JS-025-ESF-T-3. Identify this symbol. Similar comments apply to</p> | The 4th symbol in question is for the alarm reporting phone. The reduction process has made this symbol difficult to read. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 9

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | subsequent drawings. N.ME.PEP.034 | |
| 21 | | JS-025-ESF-FP8 .B GRID D-7 Label area where the infiltration test will be conducted. G.ME.MSW.005 | Agree. |
| 22 | | JS-025-ESF-FP8 B, C8, D7 Identify Bulk Permeability Test and Infiltration Test areas. G.ME.RWC.014 | Agree for the Infiltration Test area. Disagree for the Bulk Permeability Test area due to lack of existing criteria for this test. See Sandia Drawing No. R07048A/2, Revision 1 of 02/88. |
| 23 | | JS-025-ESF-FP8 B Waste package vertical tests will be conducted at ends of drifts. These are the most likely places for fires to occur. It would seem appropriate for a manual alarm station to be placed at ends of drifts in addition to stations in main drift near DAS alcoves. This spacing is consistent with that shown on JS-025-ESF-FP9.b. The location of a manual alarm station at the end of the drift is especially critical for the inclined downward central drift where smoke would rise and make it difficult for personnel (already under stress) to | Agree, will place alarm stations near the ends of the Waste Package Vertical Test drifts. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 10

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|---|
| | | <p>quickly move up the 12% grade for more than 200 ft. to pull the alarm and then return to fight fire. Subsequent ECRs (not approved) place DAS alcove mid location in drifts so the alarms shown in those locations are appropriate. L.ME.DGW.015</p> | |
| 24 | | <p>JS-025-ESF-FP8 B Alarming is shown in areas (e.g., extension drifts) which are primarily travelways with little personnel occupancy, therefore the distance interval between alarms can be increased in these areas. T.ME.SCS.017</p> | <p>Disagree, according to NFPA 101 Life Safety Code, manual alarm station boxes "shall be provided so that travel distance to the nearest box will not be in excess of 200 ft." 7-6.2.4. In addition Chapter 3-5.2 of Standard 72F requires that loudspeakers be placed so that their operations will be clearly heard.</p> |
| 25 | | <p>JS-025-ESF-FP8 .B Either the manual station symbol is shown incorrectly or else we have a new unidentified symbol of a solid square rotated 90 degrees inside a square. If it is a manual station, it appears that some devices in close proximity of others should be deleted. N.ME.PEP.035</p> | <p>The drawing reduction process has changed the appearance of the manual station symbols.</p> <p>Criteria used for locating manual alarm stations was:</p> <ol style="list-style-type: none"> 1. Located at the exits of each drift. NFPA 101 7-6.2.3. 2. Located not more than 200 ft. travel distance. NFPA 101 7-6.2.4. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 11

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-------------------|---|---|
| 26 | JS-025-ESF-FP8 .B | <p>As speakers are not necessarily directional, it appears that we have more speakers than necessary in some areas while in other areas speakers may be too far apart to be heard distinctly.</p> | <p>3. Located at each Data Acquisition Station. (H&N)</p> <p>4. Located near each area that may present an operational hazard. (H&N)</p> <p>Based on this criteria H&N will review the placement of manual stations and delete any that are excess, in Title II. Disagree, according to NFPA 101 Life Safety Code, manual alarm station boxes "shall be provided so that travel distance to the nearest box will not be in excess of 200 ft." 7-6.2.4. In addition Chapter 3-5.2 of Standard 72F requires that loudspeakers be placed so that their operations will be clearly heard.</p> <p>Disagree, the speaker represented (manufactured by Atlas, Model AP-15TU) has a directivity index of 8dB which means that it is 8dB more directive on axis than a nondirective speaker. It has a high sensitivity rating (121dB at 4' at 15 watts) which allows for a greater distance between speakers. The intent of the design is to comply with NFPA-72F requirements for alarm messages to be clearly heard.</p> |

N.ME.PEP.090

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 12

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Mechanical

| COMMENT NO. | PAGE REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---|---|
| 27 | <p>JS-025-ESF-FP9 B There appears to be an inconsistency between this drawing and the previous drawing JS-025-ESF-FP8.B. This drawing states that typical spacing for fire alarm stations is 400' but the previous drawing shows the spacing as 200'. R.ME.JLB.002</p> | <p>Agree, inconsistency is due to the criteria used to select locations of alarm stations. See resolution #25.</p> |
| 28 | <p>JS-025-ESF-FP9 .B Speakers 100' apart will preclude distinctly hearing voice messages. N.ME.PEP.036</p> | <p>Disagree, see resolution #26.</p> |
| 29 | <p>JS-025-ESF-FP9 B Remove speaker and visual indicators between alarm stations and locate only at alarm stations. The scheme shown is over-kill and subject to unacceptable failure rates based on the sheer number of units. T.ME.SCS.018</p> | <p>Disagree, speakers must be placed to meet NFPA 72F requirements for evacuation signals to be clearly heard. Visual indicators are placed with speakers to draw visual attention to the alarm notification in temporary noisy locations.</p> |
| 30 | <p>JS-025-ESF-FP11 .B AND OTHERS Smoke detection may be of some value in areas used only by scientists but cannot be used during mining or construction. If the usage will change from scientific to other</p> | <p>Agree, smoke detection will be used in areas after mining and construction operations have been completed. Multiple zoning with zone shutoff will be used. The SDRD (1.2.6.7.8) requires electronic fire detection in the underground areas.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 13

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | <p>purposes, a zone shut off and multiple zoning are recommended to minimize false alarms.</p> <p>As these areas are supposed to be free of combustibles or sprinklered, the cost-effectiveness of the added smoke detectors is questionable.</p> <p style="text-align: right;">N.ME.PEP.037</p> | |
| 31 | | <p>JS-025-ESF-FP12 .B GRID C,D-6,7 Label area where the infiltration test will be conducted.</p> <p style="text-align: right;">G.ME.MSW.006</p> | Agree. |
| 32 | | <p>JS-025-ESF-FP12 B, C8, D7 Identify Bulk Permeability Test and Infiltration Test areas.</p> <p style="text-align: right;">G.ME.RWC.015</p> | <p>Agree for the Infiltration Test area. Disagree for the Bulk Permeability Test, see comment #22.</p> |
| 33 | | <p>JS-025-ESF-FP12 .B AREA 8E Data Acquisition alcove adjacent to Sequential Drift #2 might have to be relocated due to blast damage. Recommend H&N coordinate with LANL and F&S.</p> <p style="text-align: right;">J.ME.RSW.007</p> | <p>H&N will use the latest approved version of the Main Test Level for the Title II design. Blast damage to the Data Acquisition alcove will be determined by others.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 14

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

34 JS-025-ESF-FP12 .B AREA 9E
Fueling Area is in different location than the area shown by F&S Drawing FS-GA-0160, Rev B, 100 Percent Drawing submittal. Recommend that H&N affect an interface with F&S.
J.ME.RSW.006

Agree.

35 JS-025-ESF-FP12 B
General Note #6 states that automatic smoke detection will be provided in all areas not covered by the sprinkler system. If the smoke detection system is activated during the construction phase, there will be many false alarms due to machinery/equipment exhaust gases and dust. For this reason, the system should be zoned so areas susceptible to false alarms can be isolated during construction or those parts of the system should not be installed until major construction is complete.
R.ME.JLB.015

Agree, also see resolution #30.

36 JS-025-ESF-FP13 B
Implied coverage of smoke detection units is excessive. Since this is a 100 percent closed ventilation system,

Disagree, "detectors placed in environmental air ducts or plenums shall not be used as a substitute for open area detectors". NFPA-72E, paragraph 4-5.2.I. The type of smoke

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 15

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| | | <p>detectors need only be placed at specific equipment/service areas and in the principal return air ducts. Also the method/system to be used for detection needs to be identified. T.ME.SCS.019</p> | <p>detection device used will be identified in Title II.</p> |
| 37 | | <p>JS-025-6000-M4 .B The ventilation air flow pattern in this building flows across the welding and storage areas toward other occupied spaces including the office. Ability to control chemical exposures in accordance with 30 CFR 57.5001 can be improved by moving the supply air diffuser to the building centerline. Revise drawings as appropriate. T.ME.SWP.006</p> | <p>Local welding exhaust hood and portable cone should minimize this problem. The centerline of this building is reserved for an I-beam hoist.</p> |
| 38 | | <p>JS-025-6000-M4 .B Compliance with 30 CFR 57.4530 requires sufficient exits for prompt escape in case of fire. Consider adding second means of egress from office (not counting electric rolling doors). T.ME.SWP.007</p> | <p>Disagree, not required by code due to low occupancy.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 16

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

39 JS-025-6000-M5 .B
Provide an emergency eyewash in the shop building to comply with 29 CFR 1910.151 (c).

T.ME.SWP.008

No corrosive materials have been identified to warrant an emergency eyewash.

40 JS-025-6000-M6 B
SHOP BUILDING 6000 COMPRESSED AIR SYSTEM PLAN

OSHA-1910.169 (b) (3) (i) and CFR 30 Sec. 57.13011 requires that every air receiver be equipped with one or more safety relief valves. The total relieving capacity of each valve shall prevent pressure in the receiver from exceeding the maximum allowed working pressures by 10%.

R.ME.FAS.002

Agree, standard feature that will be identified in the compressed air system specifications.

41 JS-025-6000-M6 B
Compressed Air System Plan: Consider providing separate fresh air intake for compressor.

C.ME.EOJ.001

Volume of compressed air (18 CFM) does not warrant a separate air intake.

42 JS-025-6000-M6 B
Drop leg detail 2: Identify shut-off valve.

Agree, will add call out.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 17

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | C.ME.EOJ.002 | |
| 43 | | JS-025-6000-M7 .B GRID G-10 Designate storage area as "non-combustible" storage, because it is adjacent to welding area. T.ME.SWP.010 | This would be an operational function which is not shown on the design. This area will not be designated as a chemical storage area as defined in the SDRD. |
| 44 | | JS-025-6000-FP1 .B AND OTHERS The roof slope should be shown to determine sprinkler coverage and deflector alignment. N.ME.PEP.042 | Agree, will provide. |
| 45 | | JS-025-6000-FP1 .B Sprinklers will be required under the stair. N.ME.PEP.091 | Agree, will provide. |
| 46 | | JS-025-6000-FP2 .B AND OTHERS The drawing does not depict single and multiple cable as shown on drawing JS-025-ESF-T4.A. N.ME.PEP.043 | H&N will clarify in Title II. |
| 47 | | JS-025-6000-FP2 .B AND OTHERS General Note 5 should cite drawing T4.A, in addition to T3.A N.ME.PEP.092 | H&N will clarify in Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 18

COMMENT REVIEWER'S COMMENTS
NO. PAGE

RESOLUTION

48 JS-025-6000-FP2 .B AND OTHERS
The fire alarm sound above ground should
be the same as underground. Do not
mix bells with speaker-horns.
N.ME.PEP.093

Agree.

49 JS-025-6000-FP2 B
Fire Alarm Plan: Change "Water Flow
Switch" to "Water Flow Indicator" and
specify paddle wheel or pressure type,
or include both options. Applicable
to all FP drawings.
C.ME.EOJ.003

Agree, will change callout. Specifications
will clarify the paddle wheel type.

50 JS-025-6001-M2 .B
Provide an emergency eyewash in the
warehouse building to comply with 29
CFR 1910.151 (c).
T.ME.SWP.011

No corrosive materials have been identified
to warrant an emergency eyewash.

51 JS-025-6001-M2 B
Plumbing Plan: Add VTR from Floor Sink.
C.ME.EOJ.004

Agree, will add "VTR".

52 JS-025-6001-FP2 B
Fire Alarm System Schematic: Replace
"Water Flow Switch by Sprinkler
Contractor" with "Water Flow Indicator."
C.ME.EOJ.005

Agree, see comment 49.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 19

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------|--|---|
| 53 | JS-025-6002-M4 | <p>The "FS-CA-0033 Hoist Resistor Bank Calculations" adequately determine the resistor heat generated at high torque, low slip conditions. These are conditions commensurate with or exceeding the ES-1 and ES-2 production duty cycles requirements for the hoists. The torque-speed requirements for handling materials have not been addressed. As is noted in the calculations, those hoisting requirements could severely impact the resistor sizing, cooling and hoist control methods. A list of probable material hoisting needs should be developed in order that the hoist consultant can adequately determine if the present design will be impacted.</p> <p>T.ME.JHM.002</p> | <p>Coordination with F&S will be accomplished prior to finalization of Title II design.</p> |
| 54 | JS-025-6002-M4 | <p>Reverse the air flow for the ventilation fans for the resistor banks. The heat should be drawn from above the banks and exhausted fom the building rather than force it away from the banks into the surrounding building areas.</p> <p>T.ME.JHM.005</p> | <p>Agree, will revise in Title II.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 20

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| 55 | | JS-025-6002-M4 B Domestic Water Isometric: Show height AFF for PRV. (Applicable to all buildings with PRV.) C.ME.EOJ.007 | Agree, will add dimension. |
| 56 | | JS-025-6002-M4 B Maintain a minimum 5 foot separation between the sanitary sewer lines and the buildings to avoid interference with the footings. C.ME.EOJ.006 | Agree, will add dimension. |
| 57 | | JS-025-6002-M4 B, FP1.B, E3.B, W1.B The above drawings should agree with FS- GA-0016 and FS-GA-0034 that show temporary building enclosures for the stage hoists for ES-1 and ES-2 sinking. R.ME.DLK.013 | Agree, exact criteria for temporary enclosures will be defined and incorporated at 30% of Title II. |
| 58 | | JS-025-6002-FP1 .B In an emergency, the hoist operator should have a number of things to do. The strobe lights and the alarm signals will be a distraction. Recommend that each operator be given an "acknowledge" button which will only stop the local alarms in his facility. | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 21

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|--|
| | | N.ME.PEP.094 | |
| 59 | | JS-025-6002-FP1 .B The fire alarm strobe lights are behind the operator and the cabinet. Recommend they be relocated for visibility. | Agree, will incorporate in Title II when cab design is finalized. |
| | | N.ME.PEP.048 | |
| 60 | | JS-025-6006-M1 .B Ventilation design does not appear to heat 2 offices at Grid C-9 and computer room; it does not ventilate workstation room. Modify design, as appropriate, to improve indoor air quality. | Agree, H&N will reevaluate the heating requirement at the next Title II submittal. |
| | | T.ME.SWP.012 | |
| 61 | | JS-025-6006-M1 Provide conditioned air to the workstation room and the two offices using air conditioning or heat pump systems as required. | Agree, H&N will reevaluate the heating requirement at the next Title II submittal. |
| | | T.ME.RLT.005 | |
| 62 | | JS-025-6006-M1 B, 9F, 10F Furnish ventilation to workstation or indicate means of temperature control if this room is part of computer room | Agree, H&N will reevaluate the heating requirement at the next Title II submittal. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 22

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|--|
| | | system. T.ME.SCS.029 | |
| 63 | | JS-025-6006-M1 B HVAC Plan: Redesignate "Dry Cooler Remote Heat Exchanger" as "Air Cooled Condenser Unit." C.ME.EOJ.011 | An air cooled condenser applies to a split-system DX outdoor unit. This cooler is a glycol coil heat exchanger connected to a water cooled condenser that is located within the indoor unit. |
| 64 | | JS-025-6006-M1 B HVAC Plan: Indicate glycol piping to be located in raised floor space. C.ME.EOJ.010 | Agree, will add callout to clarify. |
| 65 | | JS-025-6006-M2 B Domestic Water Isometrics: Provide check valve in CW-drop to process cooling units. C.ME.EOJ.012 | Agree. |
| 66 | | JS-025-6006-M2 B Plumbing Plan: Suggest converting san. sewer system to a combination waste-vent system and eliminate VTRs. C.ME.EOJ.013 | Length of run exceeds recommended distance for combination waste-vent lines. VTR's preferred. |
| 67 | | JS-025-6006-M2 B SURFACE DATA BUILDING PLUMBING PLAN | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 23

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|---|
| | | <p>Presently shown in the UPS Room is an eye wash station that is there because a battery charging station is located in this area. To comply with OSHA-1926.441 standard, a shower must be installed within 25 feet of a battery charging area.</p> <p style="text-align: right;">R.ME.FAS.001</p> | <p>Agree, will upgrade face/eyewash to shower and eyewash station.</p> |
| 68 | | <p>JS-025-6006-FP1 .B If possible, there should be a separate fire zone for the computer room to kill power and call for assistance.</p> <p style="text-align: right;">N.ME.PEP.050</p> | <p>Agree.</p> |
| 69 | | <p>JS-025-6006-FP1 .B Dry-charged sprinkler system was requested for computer areas in both the Surface and Subsurface Data Buildings. H & N drawings show Ordinary Hazard, Group 2, Wet-Pipe sprinkler system.</p> <p style="text-align: right;">A.ME.TJM.014</p> | <p>Comment understood, system will be reevaluated before resubmittal of Title II.</p> |
| 70 | | <p>JS-025-6006-FP1 3 The halon system needs to be included in this fire protection plan.</p> <p style="text-align: right;">J.ME.RDE.005</p> | <p>Subject is addressed on General Note 4.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 24

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|--|
| 71 | | JS-025-6006-FP1 .B There has been no documented substantiation and justification for the added cost of a Halon System. It is not required by code. If installed, in addition to meeting NFPA 12A, it must also meet DOE/NV standards for both design and equipment. (This applies to all Halon Systems). N.ME.PEP.095 | SDRD 1.2.6.8.1 specifies a Halon System. |
| 72 | | JS-025-6006-FP1 B Fire Protection Plan: Provide siamese FD connection ILO single connection. C.ME.EOJ.014 | Only a single fire department connection is required at the NTS for facilities of less than 5,000 sq. ft. (acceptable to the authority having jurisdiction). |
| 73 | | JS-025-6006-FP2 .B A graphic annunciator panel is recommended for the computer smoke detectors. N.ME.PEP.051 | Agree, will provide in Title II. |
| 74 | | JS-025-6006-FP2 .B The vault must meet DOE/EP-0108. N.ME.PEP.096 | Agree. |
| 75 | | JS-025-6006-FP2 B Furnish detectors in UPS room and records vault. | Smoke detectors are not required in UPS rooms. A detector will be provided in the vault. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 25

Name of Reviewer H&N Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | T.ME.SCS.030 | |
| 76 | | JS-025-6006-FP2 .B All smoke detectors may be the same type (photo electric). There is no need for ionization type under the floor (see NFPA 72E). | Agree |
| | | N.ME.PEP.097 | |
| 77 | | JS-025-6006-FP2 B Smoke detection (photoelectric) must also be provided in the Records Vault per DOE/EP-0108. | Agree. |
| | | R.ME.JLB.009 | |
| 78 | | JS-025-6007-M1 .B Egress from IDS Console Room may be blocked in the event of fire or halon discharge in the computer room. Consider providing a second means of egress. | Agree, a door will be added to the glass partition wall to allow two means of egress. |
| | | T.ME.SWP.009 | |
| 79 | | JS-025-6007-M1 B HVAC Plan: Indicate RA to indoor cooling unit by arrow. | Agree, will provide airflow arrow. |
| | | C.ME.EOJ.015 | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 26

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------------|--|--|
| 80 | JS-025-6007-M1 B | General Notes: Add to Note 4 that space under raised floor in computer, IDS, and work-station rooms is used as a SA plenum. C.ME.EOJ.016 | Agree, will provide airflow arrow. |
| 81 | JS-025-6008-M1 B | HVAC Plan: a. Clarify RA and EA duct runs at west wall. b. Provide EA outlet in shower area. c. Show space for eye wash in Lamp Room. C.ME.EOJ.018 | Agree, will provide section in Title II. Not required due to 6'6" partition walls. Agree, will provide background change. |
| 82 | JS-025-6008-M1 E9 | Have the calculations on hydrogen off gassing been completed and do they require external ventilation of the lamp room? N.ME.DDB.005 | No calculations have been performed since hydrogen out gassing is a function of the brand and type of battery. Ventilation is provided for 4 air changes per hour which should be adequate for almost all battery types. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 27

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--------------------|---|---|
| 83 | JS-025-6008-M2 B | <p>a. Recommend running piping above clg. ILO in partition for shower area.</p> <p>b. Recommend floor mounted water closets ILO wall mounted as shown in toilet area.</p> <p>c. Show T&P relief valve for electric water heaters.</p> <p>d. Indicate piping above clg. along east wall.</p> <p>C.ME.EOJ.019</p> | <p>There is no ceiling.</p> <p>Agree, both are acceptable. Floor mounted water closets will be specified.</p> <p>Agree, will provide in Title II isometric.</p> <p>See response above 83.a.</p> |
| 84 | JS-025-6008-FP1 .B | <p>Most areas of this building will be damp locations and require corrosion resistant sprinklers.</p> <p>N.ME.PEP.055</p> | <p>Agree, will provide in Title II.</p> |
| 85 | JS-025-6008-FP1 B | <p>Sprinklers in shower area is excessive, remove if allowable under current regulations.</p> <p>T.ME.SCS.034</p> | <p>Required per NFPA 13.</p> |

NES0102
7/88

Page 28

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| 86 | | JS-025-6008-FP1 B Recommend a siamese five department connection at riser. C.ME.EOJ.020 | See response to comment 72. |
| 87 | | JS-025-6008-FP1 .B Clothing baskets must not obstruct sprinklers discharge. N.ME.PEP.099 | Agree. |
| 88 | | JS-025-058-1-M1 B HVAC and Plumbing Plan: Indicate location of RA to Heat Pump. C.ME.EOJ.023 | Will add airflow arrow for clarification. |
| 89 | | JS-025-058-1FP1 .B ALL TRAILERS As long as these are grouped two trailer units side by side, with no intervening space, it is much more cost effective to sprinkler them as a single unit. All trailers must meet DOE/EV-0043. N.ME.PEP.056 | Separate sprinkler systems enable flexibility in arrangement and location which may be desired during various phases of the project. This will be considered and revised in Title II, if necessary. |
| 90 | | JS-025-058-1FP1 .B ALL TRAILERS The inspectors test (one per sprinkler system) should be located at a door so that the person, operating the valve, can observe the discharge. | Agree, this has been incorporated in both trailer layouts. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Name of Reviewer H&N Mechanical

Page 29

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | N.ME.PEP.100 | |
| 91 | | JS-025-058-1FP1 .B ALL TRAILERS In regards to all raised floor areas, see NFPA 13, Paragraph 4-4.3. N.ME.PEP.101 | Agree, space will meet the conditions allowing for the omission of sprinklers. |
| 92 | | JS-025-058-2-M1 B Partial Floor Plan - Plumbing: Show san. sewer pipe as a solid line (as per the plumbing legend). Applicable to all other drawings where shown as dashed line. C.ME.EQJ.024 | Agree, will standardize. |
| 93 | | SECTION 15140 .A 1.05 15140.A, 15190.A, 15242.A, 15260.A, 15300.A, 15365.A, 15410.A, 15440.A, 15450.A, 15480.A, 15781.A, 15782.A, 15785.A, 15811.A, 15860.A, 15865.A, 15870.A, 15875.A, 15880.A, 15885.A, 15890.A, 15910.A, 15936.A, 15990.A Insert "The Quality Assurance Level of this item/activity is found in ESF- QALAS". T.ME.PJK.053 | Where ESF QALAs apply, those QALAs will be referenced. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**

Page 30

Name of Reviewer **H&N Mechanical**

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------|---|---|
| 94 | SECTION 15140 | H&N 2.01 Pipe hangers and supports for Fire Sprinkler Systems should come from NFPA 13. | Agree, will be incorporated in specifications. |
| | | N.ME.PEP.104 | |
| 95 | SECTION 15300 | Recommend that DOE/NV Standard Specifications, 1980, be used as a guide for technical requirements. | Agree, will incorporate applicable paragraphs into Section 15300. |
| | | N.ME.PEP.105 | |
| 96 | SECTION 15365 | Many of the fire protection items in DOE/NV Standard Specifications, 1980, should apply in this specification. | Agree, will incorporate applicable paragraphs into Section 15365. |
| | | N.ME.PEP.106 | |
| 97 | SECTION 15365 | Smoke detectors, if installed, will not actuate the Halon System but will provide a separate and distinct early warning alarm. | Agree, so stated in the Life Safety/Fire Protection Subcommittee meeting conference report. (NNWSI:CR:88-032 Page 7.) |
| | | N.ME.PEP.108 | |
| 98 | SECTION 15365 | Halon designs should be based on 7% of the gross volume. The Halon System is to be actuated by fixed temperature-rate | See comment 97. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Mechanical

Page 31

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS |
|----------------|------|---------------------|
|----------------|------|---------------------|

| RESOLUTION |
|------------|
|------------|

| | | |
|--|--|--|
| | | compensated detectors and manual stations only. |
|--|--|--|

N.ME.PEP.107

COMMENT RESOLUTION SHEET

Page 1

NESS-101
7/88

Document Originator H&N
Date 8/8/88
Document Title ESF 100% Technical Review
Title I
Electrical
Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson L. B. Hall Date 9/15/88
QA Robert K. Kinnick Date 9/15/88
A/E James C. Calver Date 9/15/88
WMPO James C. Calver Date 9/16/88

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 2

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------------------------|--|---|
| 1 | JS-025-6000-E2 .B AND OTHERS | As emergency area lighting is shown, there is no requirement for exit lights. These should be deleted. N.EL.PEP.044 | Agree. |
| 2 | JS-025-6000-E2 B | The electric roll-up doors are required to have a safety stop device per NTS Construction Specifications, paragraph 9.4.2.2. R.EL.JLB.003 | Agree, will be included in the next submittal for Title II design. |
| 3 | JS-025-6000-E2 B C11 | Clarify the requirement for two 480/277 volt power panels (PP7 & PP8) instead of using one. R.EL.LJF.010 | PP-8 is the main panel which feeds panel PP-7 and PP-6. |
| 4 | JS-025-6000-E2 B E8 | Include a motor starter for the 5 hp motor on the air compressor. R.EL.LJF.013 | Agree, will be included in the next submittal for Title II design. |
| 5 | JS-025-6000-W1 B | Show telephone backboard so that it does not interfere with power panels and transformer on the same wall space as shown on Drawing JS-025-6000-E2.B-C10. | Telephone backboard will be relocated to the north wall outside of the restroom, in the shop area. JS-025-6000-W1.B, E-9. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 3

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| | | R.EL.LJF.009 | |
| 6 | | JS-025-6000-W1 B Too few phone outlets in building, add several in shop bay area. | Additional phone outlets will be added. |
| | | T.EL.SCS.023 | |
| 7 | | JS-025-6000-W1 B The last sentence of keyed note #1 should be corrected to read "UL/FM Koppers NCX nonleaching plywood". This same correction should be made to keyed note #1 on drawings JS-025-6001-W1.B, JS-025-6002-W1.B, JS-025-6006-W1.B, JS- 025-6008-W1.B, JS-025-058-1-W1.B and JS-025-058-2-W1.B. | Agree. |
| | | R.EL.JLB.004 | |
| 8 | | JS-025-6001-W1 B Too few phone outlets in building, add several in storage bay area. | Additional phone outlets will be added during Title II. |
| | | T.EL.SCS.026 | |
| 9 | | JS-025-6001-W1 B Add phone outlets in bay and service areas. | Agree. |
| | | T.EL.SCS.027 | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 4

| COMMENT NO. PAGE REVIEWER'S COMMENTS | RESOLUTION |
|---|---|
| <p>10 JS-025-6004-E1 B Phone outlets not shown on this or other drawing. Correct this ommission. T.EL.SCS.028</p> | <p>During Title I the requirement for telephone service had not been identified. Requirements will be further investigated during Title II.</p> |
| <p>11 JS-025-6006-E1 B The term "Processing Unit" should read "Indoor Process Cooling Unit" to match DWG JS-025-6006-M1.b. A.EL.TJM.012</p> | <p>Agree.</p> |
| <p>12 JS-025-6006-E1 B F7 Relocate 112 1/2 KVA transformer "TR- IDS-1" outside as it will take up at least 2 feet of the 4 feet hallway. R.EL.LJF.015</p> | <p>Agree.</p> |
| <p>13 JS-025-6006-W1 B There is a need for telephones and PA capabilities in the computer room and IDS Console Room of the IDS alcove Subsurface Data Building and IDS Surface Data Building. A.EL.TJM.013</p> | <p>Exact location of telephone outlets for the Surface Data Building 6006 and Subsurface Building 6007 will be determined during Title II. General note 5 refers to PA speakers for each building/ trailer.</p> |
| <p>14 JS-025-6006-W1 B Furnish additional phone outlets in computer room, UPS room, and communications room.</p> | <p>See comment 13.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 5

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

T.EL.SCS.031

- 15 JS-025-6006-W1 B,D,E7
The EAPBX and Mine plant experimenters intercom and a UPS should be shown in the Communications Room.

N.EL.DDB.004

EAPBX and mine plant experimenters intercom will not be located in the communications shelter.

- 16 JS-025-6007-E1 .B
Light fixtures must meet DOE/EP-0108.

N.EL.PEP.053

Agree.

- 17 JS-025-6007-W1 B
Furnish additional phone outlets in computer room, and IDS console room.

T.EL.SCS.032

Additional phone outlets will be added during Title II design.

- 18 JS-025-6007-W1 GRID G-6 TO G-11
A cross-section elevation view should be provided.

A.EL.SDF.001

Cross-section elevation views are not normally provided when depicting telephone outlet locations.

- 19 JS-025-6008-E1 B
Lighting and Power Plan: Show space for EW in lamp room.

C.EL.EOJ.021

Agree.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 6

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--------------------------------------|---|--|
| 20 | JS-025-6008-W1 B, 8E | Furnish phone outlet in supervisors and visitors locker room. T.EL.SCS.035 | Additional phone outlets will be added during Title II. |
| 21 | JS-025-ESF-E2 A Add: Notes | For general notes, see Dwg. JS-025-ESF- E1. R.EL.MAF.009 | Agree. |
| 22 | JS-025-ESF-E2 A H-3 | Applicable QALAS should be listed. T.EL.PJK.008 | Agree. |
| 23 | JS-025-ESF-E3 A H-3 | Applicable QALAS should be listed. T.EL.PJK.009 | Agree. |
| 24 | JS-025-ESF-E4 B D-3 | Applicable QALAS should be listed. T.EL.PJK.010 | Agree. |
| 25 | JS-025-ESF-E5 E6.B,E7.B,E8.A,E9.A | Applicable QALAS should be listed. T.EL.PJK.011 | Agree. |

NES0102
7/88

Page 7

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| 26 | | <p>JS-025-ESF-E2 AND E4.A Cross-references of power feeds from MPP-1 to MPP-2, 3, and 4 (Essential Power, Bays 5, 8, and 9) are incorrect. Should indicate ATS-1, 2, and 3 instead of MPP-2, 3, and 4.</p> <p>A.EL.TJM.009</p> | <p>Agree.</p> |
| 27 | | <p>JS-025-ESF-E3 .A AND OTHERS In all cases, power for the Fire Alarm Control Panel is to be taken off the 110 volt circuit, in a separate fused panel, ahead of the main disconnects.</p> <p>N.EL.PEP.030</p> | <p>Agree, details will be shown in the next submittal for Title II.</p> |
| 28 | | <p>JS-025-ESF-E3 A The number of transformers could be reduced by incorporating a central secondary substitution area to service the shops, trailers, and other surface facilities. A central area could be more easily incorporated into the design when standoff requirements and all protection systems required by 6430.1A, in particular 1640-2.3 which requires that the minimum number of transformers necessary, etc.</p> <p>J.EL.LJO.020</p> | <p>Consideration will be taken into account during Title II design.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 8

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--------------------|--|---|
| 29 | JS-025-ESF-E4 | <p>There appears to be the potential to run both the 1500 HP and the 900 HP on generator power together. This would add to the size requirement for the generators and is probably not necessary.</p> <p style="text-align: right;">J.EL.LJO.046</p> | <p>Agree, will provide a design analysis in Title II.</p> |
| 30 | JS-025-ESF-E4 | <p>There appears to be the potential to feed the 1500 HP hoist package from the generators and normal power at the same time. This could damage the hoist package. Show protection switches.</p> <p style="text-align: right;">J.EL.LJO.047</p> | <p>Agree.</p> |
| 31 | JS-025-ESF-E4 | <p>It seems that the first aid facility should be on essential power. Also any pumps etc for fire protection should be on essential power.</p> <p style="text-align: right;">J.EL.LJO.048</p> | <p>Agree.</p> |
| 32 | JS-025-ESF-E4 B | <p>Power for hoist PNL "H" 100A and HA "100" should not be from same distribution as power for hoist package. Remove</p> | <p>Agree.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 9

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| | | <p>present connection between ES-1 and hoisthouse and add facility for hoisthouse separately. J.EL.LJO.019</p> | |
| 33 | | <p>JS-025-ESF-E5 Consideration should be given to minimizing the necessary crossovers of IDS data cables with the 4160 line. Possible relocation of 4160 line to G-4 and routing data cable to back side of ES-1 and ES-2 should be considered. A.EL.TJM.016</p> | <p>Routing of IDS and power cables will be coordinated in Title II design.</p> |
| 34 | | <p>JS-025-ESF-E5 B Show the routing and/or the location with respect to each other of the buried main pad utilities (electrical duct bank, water, sanitary sewer, compressed air, mine waste water, communications) showing vertical and horizontal spacing requirements. R.EL.LJF.005</p> | <p>Agree, details will be provided in the next submittal for Title II design.</p> |
| 35 | | <p>JS-025-ESF-E5 B Power and lighting plan or some other drawing should show proposed ground net. J.EL.LJO.021</p> | <p>Grounding will be shown in Title II design.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 10

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------------|---|--|
| 36 | JS-025-ESF-E5 B | No provision for LLNL Machine Shop Trailer (See 50% Review Comment L.E.DW.010). | No criteria for the facility has been officially received. |
| | | L.EL.DGW.001 | |
| 37 | JS-025-ESF-E6 | Installation of a buried fuel tank (include all buried fuel lines) requires notifying the state (Subtitle I 9002) and providing detection, monitoring, and testing as outlined in Subtitle I.9003 and 9005. | Agree. |
| | | T.EL.THP.029 | |
| 38 | JS-025-ESF-E6 .B D-7 | Standby generators will require a registration certificate and operating permit. Emission controls should be designed to meet those requirements (NAC 445.430-445.945). | Agree. |
| | | T.EL.THP.040 | |
| 39 | JS-025-ESF-E6 B | Clarify showing the tie between the 16 MVA transformer and MPP-1 as an underground 4" conduit where on JS-025-ESF-E2.A, the tie is bus bar from a transformer transition section. | Agree, will be clarified in the next submittal for Title II. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 11

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--|--|---|
| | | R.EL.LJF.008 | |
| 40 | JS-025-ESF-E6 | B | Agree. |
| | Notes: | | |
| | Add Notes: | | |
| | For general notes, see Dwg. JS-025-ESF-E1 | | |
| | | R.EL.MAF.002 | |
| 41 | JS-025-ESF-E7 | A | Agree. |
| | Add: Notes | For general notes, see Dwg. J8-025-ESF-E1. | |
| | | R.EL.MAF.001 | |
| 42 | JS-025-ESF-E8 | A | Agree. |
| | Add: Notes | For general notes, see Dwg. JS-025-ESF-E1. | |
| | | R.EL.MAF.003 | |
| 43 | JS-025-ESF-E9 | A | Agree. |
| | Add: Notes | For general notes, see Dwg. JS-025-ESF-E1. | |
| | | R.EL.MAF.004 | |
| 44 | JS-025-ESF-E6 | B D7 | Agree, this will be provided in the next submittal for Title II design. |
| | Provide a layout of the generator building showing the location of the 8 | | |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 12

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|--|
| | | generators and their associated equipment. Include the location of the metal clad switch gear, MPP-1, MPP-2, MPP-3, and MPP-4. R.EL.LJF.016 | |
| 45 | | JS-025-ESF-E7 A Modify shaft section on ES-1 to show bottom of shaft approximately 50 feet below floor of MTL. (Shaft will not penetrate Calico Hills unit at this time.) K.EL.DW.001 | Agree. |
| 46 | | JS-025-ESF-E7 C7 Add a note stating that "there are currently no plans to excavate to the CHOR. The drawing shows how the UPS would be installed if it is later decided to so excavate". T.EL.EMC.010 | The Calico Hills Drill Room will be deleted. |
| 47 | | JS-025-ESF-E7 H&N This drawing references the Calico Hills Drill Room. It is the project position to delete references to the CHDR on drawings, yet to maintain this option. Recommend you interface with P&S to obtain the new reference shaft | The Calico Hills Drill Room will be deleted. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Page 13

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

COMMENT REVIEWER'S COMMENTS
NO. PAGE

RESOLUTION

bottom elevations.

J.EL.RSW.005

48 JS-025-ESF-W10 B
Move the EPABX and the mine plant intercom system to a more centrally located facility on the main pad. This will reduce the mean distance of the distribution lines to the individual stations.

T.EL.JHM.001

49 JS-025-ESF-W10 B,E,D8,9
The EPABX and Mine Plant Intercom System should not be located in the communications shelter. This is due to the fact that there is adequate space available in the communications room in the Surface Data Building. Another reason is that all cable from every telephone and intercom station would have to be routed to the communications shelter and back. Instead, it would be a much shorter run to the Data Building.

N.EL.DDB.001

50 JS-025-ESF-W12
A dedicated communications system for each shaft independent of any other

Agree.

EAPBX and mine plant experimenters intercom will not be located in the communication shelter.

Agree, Title II design will depict the use of separate mine phone systems for shaft sinking as requested.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 14

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| | | <p>communications system is required. This system is to provide communications between the hoist operator, collar, and shaft stations during the construction/shaft sinking phase(s). Following completion of shaft sinking and for ongoing mining of the drift(s), the multipath intercom type system proposed in this Technical Assessment Review is acceptable. E.EL.WAB.001</p> | |
| 51 | | <p>JS-025-ESF-W12 .B Normal telephone service is apparently available and could be used for reporting emergencies, especially if selective numbering is used. The alarm reporting phones shown on Drawing JS-025-ESF-T3.A should be deleted to reduce cost and complexity. N.EL.PEP.040</p> | <p>Agree, during Title II, H&N will determine if the normal dialing phone system meets the emergency needs that are served by the referenced alarm reporting phone. If the normal dialing phone service can be configured to meet emergency needs, the alarm reporting phone system will be deleted. If not, H&N will justify the use of alarm reporting phone system.</p> |
| 52 | | <p>JS-025-ESF-W14 .B GRID C-7 Relocate intercom 50 to other end of shaft. G.EL.MSW.009</p> | <p>Relocation will be reflected in Title II, after coordination with USGS.</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 15

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-----------------------------|---|---|
| 53 | JS-025-ESF-W15 .B | (And other H&N MTL drawings) are not the same geometry from the F&S drawing FS-GA-0161 (and others). This is obvious with respect to the fuel station and the sump alcove. The suggestion is that the same geometry be used in both packages. A.EL.TJM.001 | Agree, Title II drawings will reflect the same geometry. |
| 54 | JS-025-ESF-W15 B, D7 | Identify Infiltration Test area. G.EL.RWC.016 | Agree, and also, H&N will remove the room designation from the Bulk Permeability Test Area. |
| 55 | JS-025-ESF-W3 .B AND OTHERS | As one of the primary reasons for the main tunnels and shafts (not cross drifts) is to carry environmental air, it is recommended that NFPA 70, Paragraph 300-22 (c) should apply to all wire and cable that are located in the main tunnels or shafts. N.EL.PEP.038 | Agree. |
| 56 | JS-025-ESF-W3 B | Drawings, such as electrical details for the IDS cable plant, created in both H&N and F&S packages should be coordinated so that they agree. | Agree. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 16

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| 57 | | <p style="text-align: right;">A.EL.TJM.011</p> <p>JS-025-ESF-W3 B</p> <p>Change cable tray to open top, open work type tray to facilitate cable identification, maintenance and emergency repair and control. A completely closed tray will hide more problems than it will protect against. For example:</p> <ol style="list-style-type: none">1. In the confined drift space, maintenance will be prolonged and difficult (i.e., location of concealed problems, removal of bolted covers, work space, etc.).2. Ducting of line fire along enclosure access and cover length.3. Inspection problems due to enclosure opening requirements.4. Difficulty in adding or removing cable from tray.5. Tendancy of closed tray to collect water. <p style="text-align: right;">T.EL.SCS.020</p> | <p>Disagree, covered cable trays are a practical design requirement (IDS, Part 3, para 4.2.2) and NFPA 70, 300-22 (c) as expensive Plenum cables would be required if cable trays are not used. With respect to the facilitation of cable identifications, maintenance and repair:</p> <p>* The trays are wide and shallow so cables can be easily found. * The system for identification of cables will be developed in Title II.</p> <p>* The trays will be installed to allow clearance for re-entry. H&N will recommend fused terminal blocks for all multipair cables to reduce need for servicing.</p> <p>In addition, the potential problems related to the use of completely closed cable trays has been considered as follows and will be more fully investigated in Title II.</p> <ol style="list-style-type: none">1. Cables in these cables trays should not require servicing after initial installation. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 17

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|---|
| | | | <p>2. Selected fire retardant materials for cable insulation will be self extinguishing.</p> <p>3. Electrical and performance testing can be performed without entering the cable trays. Visual inspection should not be necessary.</p> <p>4. Properly located DAS's and Zone boxes, along with adequate spares, should preclude the need for cable count changes. This will be considered in Title II.</p> <p>5. Natural and engineered tray drainage will be considered in Title II. Also performance of the cable plant should not be effected by moisture in the cable trays.</p> |
| 58 | | <p>JS-025-ESF-W4 An unincorporated comment from ESF Title I 50%:</p> <p>"The drawing does not show any facility for potable water treatment." T.EL.THP.006</p> | <p>Potable water is provided from Well J-13. H&N will reference the chlorinator on the appropriate drawing.</p> |
| 59 | | <p>JS-025-ESF-W5 .B AND OTHERS Many of the Telemetry block diagrams depict more than would normally be</p> | <p>Drawings submitted contain basic information necessary for a fundamental understanding of telemetry system intent and operation. This</p> |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 18

COMMENT REVIEWER'S COMMENTS
NO. PAGE

RESOLUTION

required to meet DOE standards and usage. These should be referred to an ad-hoc subcommittee as suggested in comments on drawing JS-025-ESF-FP5.B.
N.EL.PEP.039

60 JS-025-ESF-W5 B
Include control provision to override demand for water from the 150,000 gallon tank whenever the 10,000 gallon tank is low, then restores demand when the 10,000 gallon tank is replenished.
R.EL.LJF.007

61 JS-025-ESF-W6 B, AND W17.B
Remove and relocate the communication terminal board from the hoist house.
R.EL.DLK.011

62 JS-025-ESF-W7 B, W8.B
Consideration should be given to providing a camera at the ES-2 headframe skip discharge location.
R.EL.DLK.010

is standard information contained within H&N telemetry controlled systems packages.

Agree, complete system operation and sequence of events are to be included in the next submittal for Title II effort.

Title II drawings will reflect the communications terminal removed from hoist house. The CCTV interface box will be moved to ES-2 hoist cab. A small terminal will be required for distribution of the Mine Plant and administrative telephones to their respective hoist cabs.

Agree, a camera will be added to the Title II engineering package.

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I
Name of Reviewer H&N Electrical

Page 19

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| 63 | | JS-025-ESF-W8 B The cable reel unit shown in detail 1 and 2 needs to be identified as to use and purpose. T.EL.SCS.021 | H&N will comply. |
| 64 | | JS-025-ESF-W9 B, 9C Foundation for tower appears inadequate to resist overturn from wind loading. Provide needed foundation. T.EL.SCS.022 | Exact dimensions for the tower foundation will be provided during Title II. |
| 65 | | SECTION 16010 1.05 16111, 16112, 16114, 16120, 16123, 16130, 16141, 16190, 16195, 16250, 16310, 16320, 16351, 16360, 16401, 16402, 16420, 16480 Should include "The Quality Assurance Level of this item/activity is found in ESF-QALAS". T.EL.PJK.054 | Agree, where QALAS applies. |
| 66 | | SECTION 16440 1.05 16450, 16460, 16461, 16465, 16470, 16500, 16530, 16601, 16610, 16611, 16612, 16614, 16721, 16726, 16740, 16741, 16750, 16770, 16782, 16903 | Agree, where QALAS applies. |

REVIEWER'S COMMENT CONTINUATION SHEET

NES0102
7/88

Document Title ESF 100% TECHNICAL REVIEW TITLE I

Page 20

Name of Reviewer H&N Electrical

COMMENT REVIEWER'S COMMENTS
NO. PAGE

RESOLUTION

Should include "The Quality Assurance
Level of this item/activity is found
in ESF-QALAS _____".

T.EL.PJK.055

67 SECTION 16721
DOE/NV Standard Specifications, 1980,
should be used as a guide for all
technical areas.

N.EL.PEP.113

68 SECTION 16721 3.05
Paragraph 3.05 and perhaps all fire
protection specifications should be
reviewed by the Fire Protection/Life
Safety Subcommittee. Zones will
particularly need their review.

N.EL.PEP.114

69 SECTION 16903 .A
Information pertaining to quality
control/inspection should be included
in this specification for the waterline
waterless telemetry system.

F.EL.JAJ.026

Agree.

Disagree.

Agree, will be done in Title II.

COMMENT RESOLUTION SHEET

Page 1

NES0101
7/88

Document Originator E&S

Date 8/8/88

Document Title ESF 100% Technical Review
Title I
Civil

Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson L. Beale Date 9/15/88

QA John J. Karsicki Date 9/15/88

AE M. Wilson for R.L. Bullock Date 9-16-88

WMPO [Signature] Date 9/16/88

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 2

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--------------------|--|--|
| 1 | FS-GA-0011 | Building No. 11 is identified as a warehouse. H&N drawing JS-025-ESF-C4 identifies this building as "unassigned". Correct discrepancies. T.CI.RLT.006 | Agree. Will update Dwg. to conform with H&N Dwg. JS-025-ESF-C4.B. |
| 2 | FS-GA-0011 | Building #10 is the REECO shop and Building #11 is unassigned. Change the drawing to so state. R.CI.WHG.002 | Agree. Will update Dwg. to conform with H&N Dwg. JS-025-ESF-C4.B. |
| 3 | FS-GA-0011 | No provision for LLNL Machine Shop Trailer (See L.F.DW.002-50% Review). L.CI.DGW.002 | Will coordinate with H&N. |
| 4 | FS-GA-0011 | Concerning guard rails between main fans and haul road. Consider substantial barrier to protect the fans from being hit by a haul truck. M.CI.JW.002 | Agree. Will consider substantial barrier by 60% Title II. |
| 5 | FS-GA-0011 5B | Haul road designation conflicts with actual use of road (T.F.SS.006). T.CI.SCS.002 | Haul road will be changed to H Road per H&N Dwg. JS-025-ESF-C20.B. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 3

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|-------------------|---|--|
| 6 | FS-GA-0011 5B | Remove "Haul Road" label on road. T.CI.SCS.040 | Agree. See Civil Comment #5. |
| 7 | FS-GA-0011 5C, 4C | Furnish traffic control lights for haul trucks to either side of cross over point. T.CI.SCS.043 | Agree. Will incorporate in Title II. |
| 8 | FS-GA-0011 7C | Passenger vehicle traffic pattern overlaps haul truck turn around area and conflicts with the traffic pattern shown on H&N drawing JS-025-ESF-C4.B. T.CI.SCS.042 | Agree. Will update to conform with H&N Dwg. JS-025-ESF-C4.B. |
| 9 | FS-GA-0011 D4 | In the note describing where the road goes, replace "IDS" with "muck storage". T.CI.EMC.013 | Agree. |
| 10 | FS-GA-0011 8C | Identify the purpose of burm/ramp shown. T.CI.SCS.041 | BERM/RAMP will be deleted per H&N Dwg. JS-025-ESF-C4.B. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 4

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|----------------|--|--|
| 11 | FS-GA-0011 D-C | <p>Side loading the 35 ton trucks may cause one or more of the following conditions:</p> <ul style="list-style-type: none"> o de-rated payload o increased spillage o bed modification o unbalanced loads <p>Suggest that an end loading option be provided by the design.</p> <p style="text-align: right;">T.CI.IRC.004</p> | <p>The Loading System is designed for both ways; either side loading or end loading whichever is convenient to the operator.</p> |
| 12 | FS-GA-0012 | <p>Since there is no need for the dump wall at ES-1 during the operation period, remove the wall but provide a design which allows simple reinstallation. This will open up collar area for access, ventilation, etc. in the event that a decision will be made later to sink to the Calico Hills level or a need arises to hoist rock for some other reason.</p> <p style="text-align: right;">J.CI.LJO.007</p> | <p>Agree. Will incorporate details in Title II.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 5

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

13 FS-GA-0012 C-C
Reference 30 CFR 57.18002 (a) & 57.19104

The 5-ton rated job cranes located at the shaft collars can be accidentally swung into the open shaft compartment when not in use. A lock or latch should be installed to secure the crane-boom at the farthest retracted position.

M.CI.PT.003

14 FS-GA-0012 0013, 0014, 0030, 0031,
0033

Provide a lock for the existing 5 ton jib crane to prevent the jib from swinging when not in use.

R.CI.FAS.013

15 FS-GA-0013
Meteorological information will be needed for certain tests planned in the shaft. Indicate location for meteorological equipment on the headframe.

T.CI.THP.025

Agree. Will add note on the Drawing. "Jib crane shall be provided with a locking device. Crane shall remain in locked position at all times if not in use."

Agree. Will add note on the Drawing. "Jib crane shall be provided with a locking device. Crane shall remain in locked position at all times if not in use."

Agree. Will incorporate in Title II.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 6

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

16 FS-GA-0013
Provide a lock for the existing 5 ton
jib crane to prevent the jib from
swinging when not in use.
R.CI.FAS.014

Agree. See comment Response Civil #14.

17 FS-GA-0013
Reference 30 CFR 57.19120 & 57.19129

Drawing depicts 900 hp hoist drum
gravity brake weight travels in a well
"hole" below the floor level. This
design restricts inspection,
housekeeping, and maintenance.
M.CI.PT.009

Agree. Will investigate at 60% Title II other
alternatives to allow inspection &
maintenance of gravity brake weights.

18 FS-GA-0013
In response to several comments on the
50 percent Title I design, the
Action/Response to shaft Item #18 Page 3
of 36 states "a dedicated emergency
hoisting system will be considered in
the Title I design." This is not
evident from the referenced drawings.
K.CI.DW.007

Agree. No emergency hoisting was considered
for ES-1 during operational phase because
access ladders are provided according to CA
law to the full depth of the shaft. Emergency
hoisting is provided during sinking phase
(see Dwg. FS-GA-0015). For Title II design
this additional option will be incorporated.
F&S will provide documentation that one
emergency hoist is adequate for both shafts.

19 FS-GA-0013 A-A
Reference 30 CFR 57.11001, 57.19007,
57.19083, 57.19129, 57.19130

Disagree. Tapered Guides is an added safety
feature to decelerate the conveyance before
crashing into the crash beams in the event

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-68

Page 7

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|---|
| | | <p>Tapered guides in the headframe should be removed. They are a high maintenance item, working off of cross head to maintain guides provided limited safety. Safety controllers "Lillies" installed with overtravel and deceleration cams, properly installed and adjusted to the hoist function will negate the need for tapered guides.</p> <p style="text-align: right;">M.CI.PT.002</p> | <p>of overtravel due to malfunction of the hoist controls. CFR 30 57.19036 states that headframes shall be high enough to provide clearance for overtravel and safe stopping of the conveyance. Tapered guides were discussed at the 50% Title I Review and were re-evaluated for 100% design and incorporated into the design. Platforms accessible from stairs will be designed in Title II for safe access for inspection and maintenance.</p> |
| 20 | FS-GA-0014 | <p>Provide a lock for the existing 5 ton jib crane to prevent the jib from swinging when not in use.</p> <p style="text-align: right;">R.CI.FAS.016</p> | <p>Agree. See comment response to Civil #14.</p> |
| 21 | FS-GA-0014 | <p>SECTION C-C The note for the 5 ton jib crane (for sinking bucket handling) should say "relocated", as the jib crane is not in Section C-C.</p> <p style="text-align: right;">R.CI.RRR.006</p> | <p>Disagree. Jib crane will be shown phantom outline to indicate it is located above the section. It will be marked "Relocated" on the operational phase Dwg. (See Dwg. FS-GA-0012).</p> |
| 22 | FS-GA-0014 | <p>Illustrate and label the crosshead/bonnet in all pertinent</p> | <p>Agree. Will incorporate in Title II Design.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 8

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Civil

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

sections to ensure adequate clearance space exists for the required functions. The crosshead should be the largest item moving in the headframe area.

J.CI.LJO.036

- 23 FS-GA-0014
Section C-C, area D-6 of the drawing shows a cross member at collar access area which would block access to the shaft. Remove this member and check headframe design to determine if adequate clearances exist.

J.CI.LJO.009

- 24 FS-GA-0015
To satisfy the shaft comment #85 on the 50% Title I design that the barrier wall between ES-1 and ES-2 be fireproof the man doors shown to provide access between the hoists should also be fireproof.

K.CI.DW.008

- 25 FS-GA-0015
The barrier wall between ES-1 and ES-2 hoists is shown as a concrete block wall. The H&N drawing JS-025-6002-A1A

Agree. Cross member will be deleted.

Agree. Will update to conform with H&N Dwg. JS-025-6002-A1.A.

Agree. Will update to conform with H&N Dwg. JS-025-6002-A1.A.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 9

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|--|
| | | <p>is shown as a 12 inch reinforced CMU wall. These drawings should be made compatible.</p> <p style="text-align: right;">K.CI.DW.009</p> | |
| 26 | FS-GA-0015 | <p>Collar arrangement does not show arrangements necessary to fix concepts. An additional drawing should be provided at the collar area to demonstrate how the vent system works with the doors closed, how the equipment access necessary for shaft construction is provided and other features necessary to understand the operation of the collar area especially where safety analyses are involved.</p> <p style="text-align: right;">J.CI.LJO.006</p> | <p>Disagree. See Dwgs. FS-GA-0027, & 0028 which are additional drawings in the collar area. Notes and intake airflows arrows will be added on the drawings to demonstrate the ventilation system.</p> |
| 27 | FS-GA-0015 | <p>Show fence and gate necessary to protect collar and allow access and operation around the collar.</p> <p style="text-align: right;">J.CI.LJO.034</p> | <p>Disagree. Fence & gate are not required because collar platform and doors will provide the barrier. Removable handrail and toeplate installed at the North/South side of the collar door opening provides an additional barrier if doors are open</p> |
| 28 | FS-GA-0015 | <p>The crosshead shown does not have a bonnet and therefore provides no</p> | <p>Agree. Will add cross head bonnet and dimensions.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 10

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|--|
| | | <p>overhead protection for personnel in the bucket. Add proper overhead protection. Also show dimensions of the crosshead necessary to hold the bucket stable during hoisting.</p> <p style="text-align: right;">J.CI.LJO.035</p> | |
| 29 | FS-GA-0015 | <p>0031, 0033 Consideration should be given to replacing the present suggested emergency rescue truck with a permanently mounted hoist at each shaft. The advantage to a permanently mounted hoist would be lower maintenance and higher reliability compared to the vehicle type hoist. The emergency vehicle would require time for transportation to the location along with spotting and set-up time. In addition, maintenance schedules would have to be developed for both the boom/hoist portion of the unit as well as the vehicle portion. If this unit would be down for major repairs, a similar unit would have to be available. Permanently mounted hoists will be on location at all times and could easily be replaced with a similar unit. The cost of a back up</p> | <p>Disagree. Permanent emergency hoist system would not be possible on ES-1 or ES-2 during sinking phase because of space limitation for an emergency hoist sheave in the headframe. (See sect. E-E FS-GA-0014) and hoist foundation on the surface. (FS-GA-0011). Similar space limitations exist during the operational phase. In our estimate the application of truck mounted emergency hoist is more flexible and economical.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 11

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| | | hoist unit would be considerably less than the vehicle unit. R.CI.FAS.006 | |
| 30 | | FS-GA-0015 AND 0031 AND 0032 Reference 30 CFR 57.19111 During shaft sinking, fixed ladders or an escape hoist shall be provided. Emergency torpedo truck must comply with personnel hoisting standards. Fixed emergency hoist is recommended. M.CI.PT.006 | Agree. The truck mounted hoist will be provided for ES-1 and ES-2 for sinking phase and will be designed to comply with federal safety provisions and personnel emergency hoisting standards. The procurement specification will be written by 60% Title II. |
| 31 | | FS-GA-0015 4B Indicate clearances and/or special construction allowances for removal of shaft sinking drill jumbo. T.CI.SCS.044 | Disagree. Adequate clear access space is provided in headframe framing (13' x 28') for equipment handling during construction phase. Jib crane will be used for installation. No special provisions are required for drill jumbo. Information on the dimensions of the drill jumbo will be added in Title II. |
| 32 | | FS-GA-0015 B5 The position of the collar door air cylinders causes the following concerns: | Agree. Alternative arrangements for collar door with air cylinder under the collar platform will be developed and evaluated with operator (REECo) before Title II design will be started. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 12

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

o Extended rams in the closed door position will be subjected to abrasion and bending loads during materials handling, leading to reliability problems.

o The pivoting of the cylinder during operation will required extensive guards and shields to ensure safety, thereby restricting the usable work space.

Suggest that the cylinders be lowered and incorporated into the collar deck framing.

T.CI.IRC.003

33 FS-GA-0015 B5
Air door attachment to headframe appears to be unnecessarily complicated. The size of the headframe is larger (14') than the collar doors also the surface obstruction should be reduced to limit items of personnel safety exposure to tripping and hampering access, etc.

J.CI.LJO.005

Agree. To simplify we suggest locating the cylinders under the collar doors. Refer to comment #32.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 13

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------|--|---|
| 34 | FS-GA-0016 | Reference 30 CFR 57.19000 Recommend that double-drum stage hoist be replaced by two single drum hoists to satisfy rope stretch, tension and balance of the Galloway staging. M.CI.PT.008 | Agree. Will revise & update to two single drum hoists during Title II. |
| 35 | FS-GA-0016 | The double drum galloway hoist will not be acceptable. This should be two separate winches properly designed to support the galloway needs. J.CI.LJO.018 | Agree. See comment response Civil #34. |
| 36 | FS-GA-0016 5-C | Show two stage winches as opposed to a single double drum hoist. R.CI.WHG.003 | Agree. See comment response Civil #34. |
| 37 | FS-GA-0016 | The winches are too spread out and will interfere with operations around the shaft. Relocate all possible winches to a suitable location near the hoist house. Reduce form winches to two only if the third winch is the congestion problem. | Disagree. The winches are spread out for the following reasons: (a) To accomodate a possible bldg. enclosures for each winch. (b) To avoid rope interference with the headframe backleg bracings. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 14

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

J.CI.LJO.045

38 FS-GA-0016 0025, 0033, & 0171
Drawing does not have QALAS stamp.
T.CI.PJK.002

(c) To avoid congestion and foundations overlapping.

Agree. QALAS stamp will be added.

39 FS-GA-0025
Since the surface fans are so close to the shaft collar, the designers should consider putting additional noise control on the fans to back up the silencers shown. The additional backup could be done with an additional wall or enclosure made of sound attenuating material.

Agree. Will investigate and incorporate in Title II Design.

Note: The title box on this drawing shows ES-2 rather than ES-1.
K.CI.JEM.002

40 FS-GA-0025
Title identifies picturization as ES-2 plans and section. Should be ES-1 plans and section.
T.CI.RLT.008

Agree. Will revise.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 15

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|-------------------|---|----------------------------------|
| 41 | FS-GA-0025 | Title block should be changed from "ES-2" to "ES-1". J.CI.LJO.008 | Agree. Will revise. |
| 42 | FS-GA-0025 1B | Drawing numbers referenced do not exist. T.CI.SCS.046 | Agree. Will coordinate with H&N. |
| 43 | FS-GA-0025 B, C-3 | Show that the slope on the utility tunnel is away from the shaft. Shaft Item #3 from the 50% design review agreed to show this slope - (also on Section A-A Drawing FS-GA-0026). K.CI.DW.018 | Agree. Will revise. |
| 44 | FS-GA-0025 3C | Utility tunnel sill at shaft collar exit not shown. Slope of utility tunnel not shown. T.CI.SCS.045 | Agree. Will add. |
| 45 | FS-GA-0025 3C, 3B | Show slope of utility tunnel (T.F.SS.015). T.CI.SCS.003 | Agree. Will add. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 16

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|---|
| 46 | FS-GA-0025 | PLAN, ZONES A5 & A6 Revise section line A-A to reflect picturization of utility tunnel shown on Drawing FS-GA-0026, Section A-A, Zone D-6. T.CI.RLT.007 | Agree. Will revise. |
| 47 | FS-GA-0025 | AND 0026 Show area where screens and cleanout door are located to separate trash from up cast duct and to protect the fan. R.CI.WHG.004 | Agree. Cleanout or inspection door is shown on drawing. Screen will be added. |
| 48 | FS-GA-0025 | PLAN AND SECTION C-C Change water supply line size to 6 inches to agree with pipe table on Dwg. FS-GA-0230. T.CI.RLT.009 | Agree. Will revise. |
| 49 | FS-GA-0025 | R/B THRU 0028 R/B Identify the areas in the collar concrete that require reinforcing steel. F.CI.JAJ.004 | Reinforcing steel for collar concrete will be shown on separate drawings in Title II. |
| 50 | FS-GA-0025 | RV.B, FS-GA-0040 RV.B, FS-GA-0050, RV.B Experience at the NTS has shown that | Agree to the comment as general statement of fact. However, AE has designed these systems to satisfy criteria and requirements, |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 17

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Civil

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

vent ducts in primary access ways remove valuable space that can be used to provide increased areas for conveyances. Removal of the vent duct (ventilation would then be a flow through system) would allow a substantially larger conveyance and significantly improved operating conditions which would benefit the ESF for the life of the facility.

E.CI.SAT.001

51 FS-GA-0026

There does not appear to be a requirement for the ring beams in the water ring structure. Since they would hamper pump installation, clean out, etc., the beams should be removed. Liner plates without ring beams should have adequate structural strength for probable ground stress. Required shape can be maintained by extending liner plate lip into concrete of above pour.

J.CI.LJO.051

52 FS-GA-0026 REV B

A pump should be installed in the water ring with a flow meter to measure any output of water flowing from the water

as presented, also refer to Ventilation Comment #2.

Agree, but the elimination of ring beams must be supported by stress analyses which will be performed in Title II.

Disagree. If required, the water ring will be provided with drain pipe and gravity flow down to the MTL Mine Waste Water Pump Station (see FS-GA-0235). The minimal amount of

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 18

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

ring. A method of handling and metering the water that collects in the water rings should be provided.
A.CI.SDF.007

water, which is expected from the collar level, does not justify the installation of pump and flowmeter.

53 FS-GA-0026
Show or otherwise indicate that the collar structure is a reinforced concrete structure.
J.CI.LJO.052

Agree. The requirement and extent of reinforcing will be determined in Title II Design.

54 FS-GA-0026 6C
Utility tunnel wire enclosure now shown in this view.
T.CI.SCS.047

Agree. Will revise.

55 FS-GA-0026 REV B GRID C-7
The 12' dia arrow extends to the rough edge of the concrete. It should extend to the inside of the concrete liner.
A.CI.SDF.008

Agree. Will revise.

56 FS-GA-0027
A safety ladder is shown in ES-2 on Drawing FS-GA-0025 and others. A similar safety ladder is needed in ES-1 in the event there is trouble with that hoist and passengers must either

Disagree. Not required by SDRD.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 19

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| | | climb up or down in order to get out. N.CI.PEP.057 | |
| 57 | | FS-GA-0027 The "Plan-Headframe Foundation" does not show any headframe foundation information. Add necessary information to fix headframe foundation concepts. Add section to ensure no interference problem etc. exists. J.CI.LJO.050 | Disagree. This is a Title I design general arrangement drawing. The plan headframe foundation is the collar structure and headframe foundation. Additional details will be added in Title II Design after Title II planning is completed. For sections refer to FS-GA-0028. |
| 58 | | FS-GA-0027 6B Hoist rope relief opening in shaft collar doors should be shown and identified. T.CI.SCS.048 | Agree. Will show. |
| 59 | | FS-GA-0028 7C, 6C Remove collar door air cylinders and replace with below deck hydraulics with slow release should system fail and door shut without the capability to control their rate of decent or hold them at one position. T.CI.SCS.049 | Agree. See response to comment Civil #32. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 20

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Civil

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

60 FS-GA-0030
Provide a lock for the existing 5 ton
jib crane to prevent the jib from
swinging when not in use.
R.CI.FAS.015

Agree. See response to comment civil #14.

61 FS-GA-0030 6C
Wire enclosure extends over hinged
platform, obstructing the movement of
the hinged platform.
T.CI.SCS.050

Agree. Will revise wire enclosure to clear
hinged platform in Title-II.

62 FS-GA-0031
Meteorological information will be
needed for tests conducted in the
shaft. Indicate location of
meteorological equipment on headframe.
T.CI.THP.031

Agree. Will incorporated in Title II.

63 FS-GA-0031
Provide a lock for the existing 5 ton
jib crane to prevent the jib from
swinging when not in use.
R.CI.FAS.017

Agree. See response to Civil #14.

64 FS-GA-0031
In response to several comments, on the
50 percent Title I design the
Action/Response to shaft Item #18 Page 3

Disagree. Truck mounted emergency hoist
system with torpedo cage for sinking and
operational phase is shown on Dwgs. FS-GA-
0031, 0033, 0040, 0042 and 0058.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 21

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

of 36 states "a dedicated emergency hoisting system will be considered in the Title I design." This is not evident from the referenced drawings.
K.CI.DW.006

- 65 FS-GA-0031
It is recommended that all aboveground diesel or gasoline powered vehicles/equipment which are routinely in close proximity to the shaft openings (dump trucks, forklifts, end loaders, etc.) be required to have an automatic extinguishing system built into the engine compartment. An uncontrolled fire involving these items could be catastrophic because it may not only damage the headframe and cables, which could severely affect the whole project, but smoke would probably enter the shaft through the ventilation system and threaten the lives of personnel underground.

R.CI.JLB.012

- 66 FS-GA-0031 0013
HEAD FRAME - OPERATION PLAN, Elevation & Section

Agree. Will be addressed in the next submittal of this procurement specification in Title-II.

Refer to Mining Comment #19.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 22

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

It is recommended that the tapered guides at the top of the headframe be removed. The tapered guides may experience cracking around the bolts from vibration of the headframe while in the skid dumping operation. These cracks may cause the guides to fail when needed. Also, if a conveyance would hang up on the tapered guides, it would be very difficult and hazardous to remove the tapered guides.

It is recommended that in place of the tapered guides, a procedure for good hoist and lilly control maintenance be installed. This would eliminate the need for tapered guides.

This is a counter to a 50% Title I comment.

R.CI.FAS.008

67 FS-GA-0031 A-A
Reference 30 CFR 57, 57.9034, 57.11001,
57.19103

A free floating rock deflection door at the end of the muck discharge chute will direct rock material into the truck box, and will limit rock spillage,

Agree. Will incorporate this design feature at 60% Title II Design.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 23

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

fly rock, tripping and slipping hazards.

M.CI.PT.001

- 68 FS-GA-0031 B3, B4
No facility is shown for dust control using sprays during surface muck dumping operations. This will be necessary regardless of other dust control measures taken. It will affect the collar design and require a change in water supply to the headframe.
B.CI.BC.006

Agree. Water spray system for dust control at the muck dump area will be shown on detail design drawings in Title-II.

- 69 FS-GA-0033
Provide a lock for the existing 5 ton jib crane to prevent the jib from swinging when not in use.
R.CI.FAS.018

Agree. See comment response Civil #14.

- 70 FS-GA-0034
Replace dual drum stage hoist with two (2) stage winches.
R.CI.WHG.005

Agree. Will revise and update to two single drum hoists.

- 71 FS-GA-0034
ES-2 SURFACE, SINKING HOIST LOCATION PLAN

Agree. Will incorporate.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 24

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Civil

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

Show a path of entry for emergency torpedo truck while ES-2 is in sinking mode. It seems that headframe backlegs, form hoist and stage hoist enclosure would make entry very difficult in a situation that may require timely actions.

R.CI.FAS.019

72 FS-GA-0034

Show how the emergency torpedo truck can be maneuvered into position at the shaft collar during the sinking phase with the form hoists in position.

R.CI.RRR.007

Agree. Will incorporate.

73 FS-GA-0040 7-C

Show screens and cleanout to protect vent fans from trash.

R.CI.WHG.006

Agree. Will incorporate.

74 FS-GA-0040 7B

Wire enclosure obstructs movement of hinged platform.

T.CI.SCS.051

Agree. Will revise wire enclosure to clear hinged platform at Title-II.

75 FS-GA-0040 C-C
Ref. 30 CFR 57.12082

Agree. Will investigate in Title-II. F&S will separate the water and power lines.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 25

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Civil

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

Suggest separating the water and power lines in the shaft as was done on ES-1 shaft.

M.CI.JW.003

- 76 FS-GA-0041
Show screens and cleanouts to protect vent fans from trash.

R.CI.WHG.007

- 77 FS-GA-0041 SECTION A-A
The necessity for a water ring in this location is not apparent. In this climate it may be more efficient to allow minor inflows to evaporate on the shaft walls.

T.CI.IRC.006

- 78 FS-GA-0043 .B GRID C-7
Modify cage for temporary access ladder to comply with requirement in 30 CFR 57.11026 that cage start not more than seven feet above bottom of ladder.

T.CI.SWP.023

- 79 FS-GA-0045
Regarding the 900 hp hoist, show the two new drum flanges as indicated on Drawing FS-GA-0013.

Agree. Will incorporate.

Disagree. The water ring is a safety feature and a part of the isolation joint between the shaft lining and the headframe foundation. The water ring will also intercept the water dripping from the surface during a downpour.

Agree. Will modify ladder cage.

Agree. Will incorporate.

COMMENT RESOLUTION CONTINUATION SHEETNES0102
7-88

Page 26

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Civil

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

R.CI.RRR.008

COMMENT RESOLUTION SHEET

Page 1

RES0101
7/88

Document Originator F&S
Date 8/8/88
Document Title ESF 100% Technical Review
Title I
Shaft
Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson L. Beane Date 9/15/88
QA Mike Kinnick Date 9/15/88
AE Mike Wilson R.L. Bullock Date 9-16-88
WMPO [Signature] Date 9/16/88

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 2

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

- 1 FS-GA-0050
In Shaft Data Acquisition System (DAS) alcoves are not shown. To allow safe access, they must be located in the ladderway to minimize accident potential when in the operational phase.
(50%R.F.WG.001)

R.SH.WHG.031

Agree. Will incorporate at Title II.

- 2 FS-GA-0050
The shape of the manway and shaft furnishings does not facilitate incorporation of IDS alcoves and equipment installation, access or maintenance. Provide a simple arrangement for these items.

J.SH.LJO.030

Location of IDS alcoves and equipment installation will be shown in details in Title II.

- 3 FS-GA-0050
ES-1 General Arrangements Cross-Sections

Section B-B shows landings at 40 foot intervals being typical. CRF 30-57.11025 requires that fixed ladders shall be offset and have substantial railed landings at least every 30 feet, unless backguards or equivalent protection such as safety belts and

Disagree. The landing shown on Section B-8 indicates that the next similar landing is at 40 ft., but the next staggered landing is at 20 ft., therefore distance between landings is 20 ft., which complies with CFR 30-57.11025.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 3

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

safety lines are provided. If 40 feet is to be typical, provisions will have to be made to comply.

R.SH.FAS.010

- 4 FS-GA-0050 6D, 6B
Landings shown at 40 foot intervals while note one FS-GA-0095 calls out a 20 foot interval, make consistent or explain difference. MSHA requires landings at 30 foot intervals (30 CFR 57.11041) and California Orders require a 20 foot interval.

T.SH.SCS.052

- 5 FS-GA-0050 .B GRID B-6
Required interval for ladder landings is maximum of 30 feet (See 30 CFR 57.11041). Change specified interval from 40 feet to 30 feet or less.

T.SH.SWP.021

- 6 FS-GA-0050
Indicate on the drawing what is the vertical spacing of the buntions and the pipe, cable and guide supports. Include a short vertical section that includes the vertical dimensioning of the supports and landings, etc.

See response to Shaft Comment #3.

Disagree. See Shaft Comment #3. The landing shown on Sect. B-B indicates that the next similar landing is at 40 ft. But the next staggered landing is at 20 ft., therefore the actual distance between staggered landings is 20 ft. It complies with 30 CFR 57.11041.

Drawing will be added in Title II showing vertical dimensioning of supports and landings, etc.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 4

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

R.SH.RRR.009

- 7 FS-GA-0050
The pipes shown for air, mine water supply, and dewatering are poorly located since they must be rerouted through the station areas to provide access to conveyance. Relocate behind buntons to simplify access.

J.SH.LJO.028

Disagree. No re-routing necessary, pipes are installed through the UDBR Station and are ending at Main Test Level Station, thus clearing the access to the conveyance (see Dwg. FS-GA-0085 and 009).

- 8 FS-GA-0050
The off centered arrangement of the cage makes the delayed sinking of the shaft to the Calico Hills much more difficult after the shaft is furnished. Return arrangement to be on center of shaft.

J.SH.LJO.025

Disagree. The cage located at the center or off center of the shaft will have the same implication. There is no difference between the two arrangements as far as future sinking is concerned. This issue was agreed upon at 50% (See Shaft Comment # 35 - 50% Review).

- 9 FS-GA-0050
The off center access to the conveyance requires that the equipment such as forklifts, must work closer to the edge of the drift and nearer any supports or gear installed. Move to center of shaft/drift to provide maximum operational area and separation.

J.SH.LJO.029

Disagree. The centerline of cage to the edge of drift is 8' - 10'-1/4" (see Section B-B Dwg. FS-GA-0091). With 5'-0" wide forklift, the clearance between face of forklift and drift of 6'- 4-1/4" is sufficient.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 5

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
 F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--------------------------------|--|--|
| 10 | FS-GA-0050 | <p>The arrangement places the edges of the conveyance unnecessarily close to the shaft wall and furnishings. The 6 inch clearance will not be adequate for instrument blockouts and other obstruction. Move cage away from shaft wall.</p> <p style="text-align: right;">J.SH.LJO.027</p> | <p>Disagree. No obstruction at blockouts is foreseen (see detail - 1 FS-GA-0058). Also blockouts can be relocated to clear the corner edges of the conveyance.</p> |
| 11 | FS-GA-0050 | <p>The arrangement does not allow ready access from the shaft conveyance into the manway. This will reduce safety performance in the event the conveyance is hung up in the shafts. The 50 percent status did not have this difficulty.</p> <p style="text-align: right;">J.SH.LJO.026</p> | <p>Disagree. The ready access from shaft conveyance into the manway is provided with this arrangement. No requirement is mentioned in MSHA or California Code regarding this access.</p> |
| 12 | FS-GA-0050 B 5, C AND D 5 | <p>The manway landings as shown make it dangerous to step sideways from the landing onto the ladder, and visa versa. Modify the landing to allow access to ladder by stepping straight forward.</p> <p style="text-align: right;">K.SH.DW.010</p> | <p>Disagree. Sideways step ladders are safe and are accepted by both MSHA and OSHA regulations [see OSHA 1910.27 (d) 2].</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 6

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|---------------|---|---|
| 13 | FS-GA-0050 | The size and shape of the manway does not comply with OSHA and MSHA for man access. The clearances are not adequate. J.SH.LJO.032 | Disagree. Clearance of 24" x 24" around the ladder is provided per MSHA 57.11037 and California code 7044 (d) requirements. |
| 14 | FS-GA-0050 | The installation of the life safety cable raceway, instrumentation cable, IDS cable raceways does not allow reasonable access for installation. Doorway width of 20 inches is inadequate and the area cannot be serviced from the conveyance compartment. J.SH.LJO.031 | Disagree. Installation of life safety, cable raceway, instrumentation cable and IDS cable is done during shaft outfitting stage. Only inspection of these cables is most likely required during the period of testing. This is done from the ladderway platforms. |
| 15 | FS-GA-0050 D4 | Relocate communication cable raceway on the pipe bracket such that it does not interfere with the test hole locations on the east wall of the shaft. K.SH.DW.011 | Agree. |
| 16 | FS-GA-0050 | The drawings should show the applicable dimensions to document conformance to requirements contained in MSHA, etc. | Agree. Will incorporate at 100% Title I. |

COMMENT RESOLUTION CONTINUATION SHEET

NE90102
7-88

Page 7

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

J.SH.LJO.033

- 17 FS-GA-0050 D7
Add words showing the division of work between REECO and the shaft subcontractor, as similarly shown on FS-GA-100.

T.SH.EMC.020

- 18 FS-GA-0050 A-5
Guide bracket does not have adjustment provisions for alignment as was in previous 50 percent design. Replace bracket with bunton.

Guide bracket does not have equal strength to buntons due to the limited attachment, reduced bolts and reduced concrete surface, for strength considerations. Replace bracket with bunton.

J.SH.LJO.003

- 19 FS-GA-0050 FS-GA-0100
It is unclear from the small scale of the vertical cross section whether the shaft design includes any bearing sets.

R.SH.DLK.032

Agree.

Disagree. Guide bracket is designed to have slotted holes to provide for adjustment in both directions similar to bunton connection. The concrete wall mounted guide bracket will be designed to provide same support as bunton.

All sets are bearing sets.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 8

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
 F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|---|
| 20 | FS-GA-0050 | GENERAL There are no guide backers shown. There would be less warping with dry guides if steel backers are provided. J.SH.LJO.004 | Disagree. Issue was resolved at 50% - See Shaft Comment #35, 50% Ventilation System, Duct routing and duct constructibility is simpler than 50% design, see Dwg. FS-FA-0091, 0095 and 0225 for reference and refer to Ventilation Comment #2. |
| 21 | FS-GA-0050 | GENERAL One vent duct instead of two, as in 50 percent design, will complicate ventilating the Calico Hills, UDBR, and MTL areas together. Two ducts should be provided as in 50 percent design. A better method of resolving other comments should be found. J.SH.LJO.002 | Disagree. Issue was resolved at 50% - See Shaft Comment #35, 50% Ventilation System, Duct routing and duct constructibility is simpler than 50% design, see Dwg. FS-FA-0091, 0095 and 0225 for reference. |
| 22 | FS-GA-0050 | C/D 4-5 Identify Test Holes as typical for Shaft Convergence Test. G.SH.RWC.009 | Agree. |
| 23 | FS-GA-0050 | REV B It is not clear that the testers (shaft conveyance, radial borehole, and the DAS) can get back to their respective tests for instrument changeout, etc. after the shaft steel and utilities have been installed. | This will be defined and incorporated in Title II design. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 9

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|---|
| 24 | FS-GA-0050 | SECTION AA Show total flexibility of location for instrumented test holes. A.SH.SDF.005 R.SH.WHG.008 | This will be defined and incorporated in Title II design. |
| 25 | FS-GA-0054 | The sequence shown on this drawing and the subsequent drawing indicates that the shaft furnishings will not be installed as sinking progresses. If this is the case, the requirements of the California Mine Safety Orders Article 21, Section 7044 (j) (ladder installations) cannot be met. If it is proposed to seek a variance to this requirement, this should be identified in the Title I 100% design report along with any other governing regulations it is proposed to seek variances from. K.SH.DW.017 | Agree. We need to apply for a variance from the CA code. Present design assumes a chain ladder from the bottom of the stage to bottom of Shaft. Alternative access from surface to the stage is by the emergency hoist. |
| 26 | FS-GA-0054 | 8A Drill jumbo shown scales approximately 20' x 5'. Identify as a minimum; 1) drill jumbo storage location when not in use, and 2) expected handling sequence (i.e., tripping, removal, storage, | Dimensions are preliminary. This is a Title II work item. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 10

Document Title ESF 100% TECHNICAL REVIEW TITLE I
 F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|------------|
| | | reinstallation, setup, etc.). If base of drill jumbo is 5 feet in diameter it will not pass through work stage. T.SH.SCS.053 | |
| 27 | | FS-GA-0054 A5 Under GEOLOGIC MAPPING legend, add reference to DWG. 0059 for Shaft Mapping and Photography Test. Add 0059 to Ref. Dwg. list. G.SH.TLL.009 | Agree. |
| 28 | | FS-GA-0054 A5 Change mapping increment from "20'-30'" to "6'-30'". G.SH.TLL.020 | Agree. |
| 29 | | FS-GA-0054 D1 (50 Percent G.F.TL.006), Change Note 2 reference from FS-GA-0063 to FS-GA-0163, to reference shaft Intact Fracture Test. G.SH.TLL.002 | Agree. |
| 30 | | FS-GA-0055 A5 Change "strip liner" to "strip liner form". T.SH.EMC.014 | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 11

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|--|
| 31 | FS-GA-0056 | <p>Due to safety problems, the gallows cannot be used to access ES-1 shaft test locations except where they are very close to the shaft bottom. These tests must be accessed on the main rope by a sinking cage designed especially for the task. (50% R.F.WG.004) R.SH.WHG.032</p> | <p>Agree, special service conveyance deck in conjunction with sinking bucket will be developed in Title II for access and servicing of shaft test installations.</p> |
| 32 | FS-GA-0056 | <p>Comment R.F.DK.056 from the 50 Percent Title I Design Review has not been fully addressed (shaft station breakout excavation sequence). The comment is repeated below: The general shaft station breakout excavation sequence is not shown. Demonstrate how the shaft station breakout is excavated full face as shown, within the guidelines of FS-SP-0205 and similar to the sketches shown in FS-GA-0054 and FS-GA-0055. R.SH.DLK.022</p> | <p>The shaft station breakout sequence will be shown at 30% of Title II.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 12

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|---|
| 33 | FS-GA-0056 | Show station breakout using benching. R.SH.WHG.009 | The shaft station breakout sequence will be shown at 30% of Title II. |
| 34 | FS-GA-0056 | A4 - A5 Cryderman Mucker is unable to reach into the station to muck out. Add additional sections to show the station mucking unit being lowered to station level and mucking into the sinking bucket. K.SH.DW.012 | Agree. |
| 35 | FS-GA-0056 | TEST MONITORING SECTION Length of boreholes shown in Plan and Section for Shaft Convergence Test are incorrect. They should be made consistent with FS-GA-0059. T.SH.DMR.012 | Agree. Boreholes lengths will be made consistent with FS-GA-0059. |
| 36 | FS-GA-0057 | Reference 30 CFR 57.11001 A safe means of access is not provided to test locations. The present design of the shaft sinking conveyance is not adequate to access shaft test areas. Recommend a special conveyance be designed for this function. M.SH.PT.007 | Agree. Refer to Shaft Comment #31. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 13

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|-----------------------|---|---|
| 37 | FS-GA-0057 | The drawing does not include sufficient detail of the ES-1 shaft stratigraphic column for shaft construction information. R.SH.DLK.014 | Disagree. This is not intended to be a shaft construction drawing, but a conceptual Title I Dwg. A detailed stratigraphic section is Title II effort. |
| 38 | FS-GA-0057 | Provide a companion drawing with sufficient detail of the ES-2 shaft stratigraphic column for shaft construction information. R.SH.DLK.030 | Disagree. This is not intended to be a shaft construction drawing, but a conceptual Title I Dwg. A detailed stratigraphic section is a Title II effort. |
| 39 | FS-GA-0057 2B | Add the word "approximate" before each of the three occurrences of the word location... (G.F.BG.009). G.SH.RWC.003 | Agree. |
| 40 | FS-GA-0057 GRID C-5,6 | Change words "paint brush" to one word, "Paintbrush". G.SH.MSW.008 | Agree. |
| 41 | FS-GA-0058 | The layout of the shaft buntons as shown on the plan view in zone D-4 does not agree with the bunton layout shown on | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 14

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

the plan view in zone C-7.

R.SH.RRR.010

- 42 FS-GA-0058 C6
Move instrument hole that is shown as being on Centerline to location similar to that shown in the elevation view C4, so as to not be in interference with shaft steel. Should also move other hole from right side to left side to reflect the layout shown in C7 cross section.

G.SH.TLL.013

- 43 FS-GA-0058 C7
Add dashed lines to extend the two instrument holes through the shaft liner concrete.

G.SH.TLL.012

- 44 FS-GA-0058 D4
(50 Percent G.F.TL.008) Dashed hole outlines should not extend into concrete liner in plan view (the elevation view shows the liner is not down to the level of the holes).

G.SH.TLL.003

Agree. However, please note that the hole locations for this test are intended to be field determined, and possibly interference with shaft steel must be coordinated to prevent problems.

Agree.

Agree.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 15

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|--|
| 45 | FS-GA-0058 | C4 Change "Data taken manually from the holes..." to read "Data taken with portable DAS from the holes..." G.SH.RWC.010 | Agree. |
| 46 | FS-GA-0058 | D4 Add to WORK DECK callout, "(Ref.) SEE DWG.-0072". G.SH.TLL.008 | Disagree. See "Notes" on drawing. |
| 47 | FS-GA-0058 | DETAIL 1 Grouting could close the PVC well screen. T.SH.IRC.007 | Disagree. Specifications for grouting will prohibit the blockage of the wall screen. |
| 48 | FS-GA-0058 | REV B A.SH.SDF.006 | No response required. |
| 49 | FS-GA-0059 | B-5, STEP 3 It must be recognized that the height of a shaft form is not easily adjusted. T.SH.IRC.008 | Agree. However, the location of the test holes must remain flexible to account for field conditions. |
| 50 | FS-GA-0059 | C2 Add reference to DWG. 0072 for Work Deck information. G.SH.TLL.010 | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 16

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------------|---|---|
| 51 | FS-GA-0059 C3-4 | <p>If the mapping is performed after the round is mucked, the minimum distance shown on the left should be 28' (min. of 20' from concrete to top of round per FS-GA-0054, plus the 8' round), not 20'.</p> <p>T.SH.EMC.017</p> | <p>Disagree. The distance from hard bottom to the bottom of concrete will be a minimum of 20 ft.; this can be mapped at any part of the cycle, therefore, after a pour the distance may only be 20 ft.</p> |
| 52 | FS-GA-0059 REV B | A.SH.SDF.009 | No response. |
| 53 | FS-GA-0059 | <p>ZONE A8</p> <p>To avoid possible shaft convergence measurement problems after sinking is complete, suggest adding a note to the effect that "exact location of Shaft Convergence Test and orientation of instrument holes will take into account shaft furnishings (e.g., position of buntions, guides, utilities) and ease of measurement in fully-equipped shaft."</p> <p>T.SH.DMR.005</p> | <p>Disagree. The shaft convergence test hole locations will be field determined therefore interference with shaft furnishings may not occur. Refer to Shaft Comment #42. A note will be added to Section A-A as follows: Hole locations will be coordinated with Los Alamos to take into account shaft furnishings and ease of measurements in fully equipped shafts.</p> |
| 54 | FS-GA-0059 | <p>SHAFT CONVERGENCE</p> <p>Show permanent utilities and shaft furnishings in relation to the 3 sets of convergence pins for long term monitoring. It appears that shaft</p> | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 17

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

furnishings may interfere with some measurements.

R.SH.WHG.010

- 55 FS-GA-0059 ZONE D6
In the ES-1 Shaft Cross-Section representing the Shaft Convergence Test Layout, the scale of block-outs and MPBX boreholes is different from that shown in Section A-A. They should be the same for consistency.

T.SH.DMR.004

- 56 FS-GA-0059 ZONES C3 AND B3
In the Shaft Mapping & Photography Test (Partial Elevation, and Section B-B) Camera Mounting Bar should be relabelled Strike Rail Assembly.

T.SH.DMR.002

- 57 FS-GA-0062
Detail 1 does not show the water ring required at brow. Also the shape and size of the concrete brow does not appear adequate to conform to the requirements.

J.SH.LJO.017

Agree. Consistency will be achieved.

Agree.

Agree. Water ring can be incorporated at the cold joint shown at 20 ft. above the station brow. This will be shown in Title II drawings. Second part of comment not understood.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 18

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|--|
| 58 | FS-GA-0062 | <p>Detail 2 - The plastic sump liner does not appear to be a suitable method for the following reasons: (1) Usually plastic provides slippery footing and may create safety conditions which are unacceptable, (2) The cleanup of the sump may require machinery which may damage the plastic, and (3) If the concrete is properly designed and placed, it could be essentially water tight without any liner requirement.</p> <p>J.SH.LJO.044</p> | <p>Disagree. The material under consideration is provided with a non-slip surface, and has a high impact resistance. The lining is anchored in place with headed studs thermal welded to the lining and imbedded in the concrete. All seams are thermal welded after placement to ensure complete water tightness. Damage which may compromise the integrity of the lining can be readily repaired. Since the criteria states that there shall be no leakage, concrete alone no matter how designed and placed, will not be adequate to contain the waste water.</p> |
| 59 | FS-GA-0062 | 5A | <p>Disagree. See Response to Comment #58. Metal liner is subject to corrosion.</p> |
| | | <p>Replace plastic sump liner with metal liner.</p> <p>T.SH.SCS.055</p> | |
| 60 | FS-GA-0062 | 4C | <p>Agree. Revised configuration will be shown for Title II.</p> |
| | | <p>Pin station brow to rock to avoid rock and/or concrete fall in this area.</p> <p>T.SH.SCS.054</p> | |
| 61 | FS-GA-0062 | DETAIL 1 | <p>Agree. Will incorporate in Title II design.</p> |
| | | <p>Show rock support for brow.</p> <p>R.SH.WHG.012</p> | |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 19

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------|---|--|
| 62 | FS-GA-0062 | <p>DETAIL 1 The typical liner foundation key and station brow arrangement for the ES-1 shaft liner as shown in this drawing is different from the one shown for ES-2 in drawing FS-GA-102. These differences need to be justified. J.SH.RDE.001</p> | <p>The arrangement shown in FS-GA-0102 (ES-2) is correct for both shafts. Will adjust.</p> |
| 63 | FS-GA-0062 | <p>FS-GA-0102 Reference 30 CFR Section 57.3029 Shaft liner details do not show lateral reinforcement for concrete to prevent potential slabbing. M.SH.RMB.003</p> | <p>Reinforcement details will be incorporated in Title II design for the liner sections immediately above the station brows at the UDBR and MTL.</p> |
| 64 | FS-GA-0062 | <p>FS-GA-0102 Reference 30 CFR Section 57.3029 Shaft profile and liner detail does not address bearing sets in either ES-1 or ES-2. M.SH.RMB.004</p> | <p>Disagree. In the configuration as shown, each set will be supported on brackets bolted to the shaft lining. Thus every set throughout the depth of the shaft will in fact be a bearing set. Details for support will be provided in Title II.</p> |
| 65 | FS-GA-0062 | <p>DETAILS 1 & 3 Per the curb ring detail on FS-GA-0062, the hanging rods pass through the middle of the 45 degree cold joint, not the middle of the concrete liner as shown. Same comment applies to GS-GA-</p> | <p>Agree. Will adjust.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 20

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

0102.

T.SH.EMC.019

66 FS-GA-0062 NOTE 4
Detail the type of bolt i.e. expansion
shell, resin, grout, etc.

R.SH.WHG.011

67 FS-GA-0062 R/B
Identify FS-SP-208 as an applicable
specification.

F.SH.JAJ.001

68 FS-GA-0062 R/B
Identify the areas in the shaft liner
concrete that require reinforcing
steel to assist in tension loading.

F.SH.JAJ.002

69 FS-GA-0062 SECTION A-A & DETAIL 3
DYWIDAG is a brand name. Use a more
generic term such as "hanging rod" as
on FS-GA-0063, or "continuously threaded
hanging rod". Same comment applies to
FS-GA-0102.

T.SH.EMC.018

The bolts will be 5/8" diameter - 4 ft. long
headed bolts with expansion shell anchors.

Agree.

Will identify in Title II.

Agree. Will use generic term as suggested.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 21

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

70 FS-GA-0062 TITLE: ES-1 SHAFT LINER
SECTIONS & DETAILS
The design of the shaft liner is based
on a seismic design analysis (Seismic
Design Input: TI-ST-0053).

The analysis was assigned a Quality
Assurance Level II, however, Quality
Assurance Level III data from the NNWSI
Project Reference Information Base has
been used in the analysis. This means
that the analysis cannot be used to
support the Level II Title I Design
phase and furthermore means the analysis
will have to be repeated with Level I
data to support Title II Design.
T.SH.JMD.004

71 FS-GA-0063
Show how a shortened pour can be
accomplished to accomodate in shaft
testing needs.
R.SH.WHG.013

72 FS-GA-0063
Form will be required to have doors
installed for placement of liner load
instruments required in the Shaft

Disagree. The Reference Information Base has
no assigned QA Level. It is the best
available information. As better data
becomes available it will be incorporated into
the design.

Typical pours will be 10' or 20' using
combination of 3'-6" and 6'-6" panels to
maintain shaft set spacing. The hand handled
poured lip will be bolted directly to either
a 10' or 20' form. Test locations shall be
coordinated to accommodate these pours.

Blockouts for multiple-point borehole
extensometer collars will be installed
before the concrete form is positioned. High
pressure cell will be installed using the

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 22

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

Convergence Test as noted in Appendix B of the SDRD. (50% R.F.WG.005)
R.SH.WHG.033

73 FS-GA-0063
Concrete Form -- a) Long soldiers (vertical steel posts attached to the top ring) to overlap the previous pour, would assist in the vertical alignment. b) A brick pattern (offset joint) of bolted panels would provide greater stiffness. This is a repeat of F.S. shaft comment #139 from the 50% design review.

K.SH.DW.019

74 FS-GA-0063
The curb ring structural cross section is not rigid enough to avoid bending during lowering. Additionally, the scribe pin support will receive heavy blast damage. Suggest "boxing in" the lower surface to add the needed strength and durability.

T.SH.IRC.005

75 FS-GA-0063
The curb ring detail should be modified to locate the hanging rod in an area

six pour doors provided at two levels. No additional doors are required.

(a) Agree, lifting lug bars at top ring are provided to overlap the previous pour (D7)
(b) Disagree, the brick pattern of joints would increase stiffness, however, the inherent stiffness of this configuration would inhibit stripping and would in fact overstress and bend the panels.

Disagree. Curb ring 6" deep is more than adequate to prevent deflection under its own weight. Scribe pin supports are heavy angles, not subject to damage but a blast shield of the lower surface will be considered in final design.

Disagree. Hanging rods need to be located at points which will minimize torsion of the curb ring. Filling of the rod penetratio

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 23

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

not so subject to cement filling and hangups.

Lifting lugs should be located on the inside edge of the forms rather than on top.

J.SH.LJO.012

76 FS-GA-0072

Stabilizer assemblies should pivot such that they would swing upward, which would wedge the stage preventing downward motion. This would tend to prevent inadvertent movement of the stage.

R.SH.WHG.014

77 FS-GA-0072

A/E should evaluate the risk of falls from the shaft sinking stage when it is configured to serve as a platform for shaft mapping. Compliance with MSHA regulation 30 CFR 57.11001 requires safe means of access to all working places. The drawing now shows guide wheels and removable hand rails and toe boards. It is suggested that the A/E further evaluate the trade off between removable and permanently fixed toe

space with grease will prevent cement filling.

Disagree. Lifting lugs at inside edge would decrease the clearance for stage and could cause hangups.

Stabilizer assembly will be locked in a horizontal position and will in effect wedge the stage.

Agree. Toe board will be permanently attached where possible.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 24

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

boards (i.e. fixed toe board, removable handrail) in terms of the ability to provide protection from falls and/or objects falling to lower levels. Consideration should be given to the degree of interference with mapping activities caused by toe boards (toe board, not handrail). (The relevant comment was identified as T.F.SP.017 and listed as F-144 in the 50 Percent Design Review Report).

T.SH.SWP.017

78 FS-GA-0072 .B GRID D-8
Drawing notation indicates "toe plate to be removable with handrail (typical all levels)". If mapping is only activity that handrail interferes with and all mapping will be done on lowest level, it would be safer to permanently fix handrail to sinking stage on upper levels. Modify design as appropriate.

T.SH.SWP.022

79 FS-GA-0072
SHAFT SINKING STAGE Elevations and Sections

The distances between the climbing side

Agree. Removable handrail and toe plate will be limited on upper platforms to foldable panels only.

Agree. Ladderway passage will be maintained at 24" x 24" opening.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 25

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|---|
| | | <p>of the ladder to the inner framework of the sinking stage does not meet the criteria for the ladder standards under 30 CFR, 57.11037 Ladderway Openings. This section requires a minimum of 24 inches of unobstructed cross sectional openings. The distance from the climbing side of the ladder to the inner framework measures approximately 20 inches.</p> <p style="text-align: right;">R.SH.FAS.005</p> | |
| 80 | | <p>FS-GA-0072 The access ladder should be relocated away from outside edge of galloway to prevent hanging up on objects in shaft during movement.</p> <p style="text-align: right;">J.SH.LJO.010</p> | <p>Disagree. The ladder is located entirely within the 5'-0" radius of the stage, hence, any objects in the shaft which might catch on ladder would catch on handrail or stage deck before touching ladder.</p> |
| 81 | | <p>FS-GA-0072 The ladder should be a sturdy and fixed ladder not capable of removal since serious injury could result if someone falls.</p> <p style="text-align: right;">J.SH.LJO.037</p> | <p>Disagree. SDRD Appendix B, Test Plan WBS 2.6.9.2.1.1, Page B, Paragraph 20 - Design Constraints requires completely unobstructed view for photography. Therefore, the ladder must be removable.</p> |
| 82 | | <p>FS-GA-0072 Reference 30 CFR Section 57.11037 Ladder access on Sections B-B and C-C do not</p> | <p>Agree. Ladderway passage will be maintained at 24"x 24" opening.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 26

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|--|
| | | <p>indicate if an unobstructed cross-sectional opening of 24" by 24" is being provided.</p> <p>M.SH.RMB.006</p> | |
| 83 | | <p>FS-GA-0072 SHAFT SINKING STAGE Elevation and Sections</p> <p>Proposed procedure is to use staging as a conveyance for personnel from work point to test stations, etc. If in fact staging will be used as a personnel conveyance, it must comply with the 30 CFR, Section 57,19000. Subpart R should apply only to the staging being used as a conveyance and will not affect any other components of the system.</p> <p>R.SH.FAS.007</p> | <p>Agree. Same as response to Shaft Comment #31.</p> |
| 84 | | <p>FS-GA-0072 Reference 30 CFR 57.19000</p> <p>Galloway does not meet personnel hoisting standards.</p> <p>M.SH.PT.005</p> | <p>Agree. Same as response to Shaft Comment #31.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 27

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

85 FS-GA-0072
The enclosed galloway opening for the bucket will make access to the bucket or galloway unnecessarily difficult. Also lowering gear under the bucket or on the bail will be complicated by the structure. People working on the galloway should be required to wear life safety lines to prevent falling. There is no requirement for guides through the galloway. Since the size of the galloway is so small, only necessary items should be attached.
J.SH.LJO.049

Disagree. The bucket openings at the center of the stage is a hoisting compartment and as such must be enclosed with Guarding (California Mining Code Article 35, Mine Shafts, Section 7110 Shaft Guarding). Continuous guide bars through the stage are required to prevent hang ups.

86 FS-GA-0072 6B, 6C
Increase number of guide wheels to 5 or 6. This would allow the backing off of a guide wheel to clear some obstruction (e.g., cable, test site, junction box, etc.) while still maintaining the alignment of the working stage.
T.SH.SCS.056

Disagree. Test locations shall be coordinated with utility lines and also with stage guide wheels for access and clearances. In addition, the stage geometry would have to be modified to accommodate more guide wheels which on the other hand would increase the possibility of interferences.

87 FS-GA-0072
Provide 1 ft. fold-down deck extensions on bottom level of shaft sinking stage to increase deck diameter to 12 ft. for

Disagree. It is impossible to develop fold down platform extensions around a circular platform without reducing the usable space of the platform. In case of overexcavation,

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 28

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------------------|---|--|
| | | <p>safety during geologic mapping and photography.</p> <p>G.SH.TLL.014</p> | <p>the 12" platform extensions do not provide adequate safety against accidental fall. The removable handrail, as designed, provide the necessary protection. The platform radius of 5' provides more unobstructed area for photography.</p> |
| 88 | FS-GA-0072 B7 | <p>Position bottom of fixed brattice closer (1 ft. max. hangdown) to bottom of intermediate level of work deck to provide clearance for vertically shifted geologic camera.</p> <p>G.SH.TLL.011</p> | <p>Agree. The distance between mapping and intermediate platforms can be increased and necessary clearance below fixed brattice will be coordinated with USBR during Title II design.</p> |
| 89 | FS-GA-0072 B8 | <p>The spacing between the intermediate and bottom level work decks needs to be 10 feet clear (from the top of the bottom level deck up to the lowest obstruction of the intermediate level, such as the deck support beams).</p> <p>G.SH.TLL.019</p> | <p>Agree. See Comment G.SH.TLL.011.</p> |
| 90 | FS-GA-0072 SECTION D-D | <p>Lower deck doors in closed position meet in center of shaft (i.e., the exact location for setting up the camera and surveying mount, and the strike rail</p> | <p>Disagree. In accordance with design guidelines the two door sections are designed for accidental load of 10,000 lb., which greatly exceeds the camera and men load during mapping operation. In add'n,</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88.

Page 29

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

assembly). Any damage, distortion, or misalignment of the doors or hinges could lead to loss of a flat, level area at center of shaft. Also, the movement of a person from one door to another will be sufficient to throw the surveying instrument or camera out of level. Suggest a large single door (if vertical headroom allows this) or doors of unequal length (e.g., ratio of 3/4 and 1/4) to help stabilize the central area.

T.SH.DMR.001

- 91 FS-GA-0072 B3
For Section D-D, suggest labeling upper half as "Sinking Configuration," and lower half as "Geologic Mapping Configuration."

G.SH.TLL.015

- 92 FS-GA-0085
ES-1 Shaft, UDBR Shaft Station Sections

The vertical section on this drawing shows that landings are at 20 foot intervals. This is not consistent with information given on FS-GA-0050, Section B-B.

a single base plate 1" thick is a part of the camera stand assembly and is bolted to both doors providing a flat area for instrument installation and leveling.

Agree.

Disagree. The landing shown on FS-GA-0050 indicates that the next similar landing is at 40 ft. but the staggered landings are spaced at 20 ft.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 30

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|--|
| | | R.SH.FAS.011 | |
| 93 | FS-GA-0085 | FS-GA-0091 Suggest access ladder be inclined as much as can be accommodated. Even a 3-foot step-out of the ladder will greatly reduce fatigue in persons using the ladder. | Disagree. Space limitation does not permit inclined ladders. |
| | | T.SH.DMR.013 | |
| 94 | FS-GA-0085 | The pipes and the manway block access to the cage. | Disagree. The manway is provided with a hatch and handholds and will not interfere with the access to the cage if the hatch is in closed position. No access is provided for the cage at the east side of the station. One access at the west side is sufficient for the UDBR station. |
| | | J.SH.LJO.011 | |
| 95 | FS-GA-0085 | The brow set which is attached to the underside of the concrete appears to be a weak installation since downward force would tend to pull the fasteners out of the concrete. | Disagree. The steel beam attached to the underside of brow concrete is intended for shaft station steel column lateral support only. There is no downward force acting on this beam. |
| | | Concrete in brow and hitch should be reinforced with rebar. | Agree. Details of reinforcement for the brow and hitch will be part of Title II design. |
| | | J.SH.LJO.038 | |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 31

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|---|
| 96 | FS-GA-0085 | REV B GRID C-1 C-7 There is not any concrete support in the station brow. A.SH.SDF.010 | Station brow suspended from shaft liner, foundation key (see Detail - 1, Dwg. FS-GA-0102). |
| 97 | FS-GA-0085 | B6 The space for future loading chute will interfere with the Excavation Effects Test extensometer instrumentation. Delete. G.SH.TLL.016 | Agree. Space for future loading chute will be deleted. |
| 98 | FS-GA-0085 | REV B GRID C-4 There are no posts strategically placed around the shaft circumference in order to support shaft steel and utilities. A.SH.SDF.011 | Disagree. Section A-A shows four columns which is supported by beams at the station level and extended up to the underside of shaft brow will support shaft steel and utilities. Details will be added in Title II. |
| 99 | FS-GA-0085 | 6C Four inch water line is identified as 6 inch line in table on FS-GA-0230. T.SH.SCS.057 | Agree, will revise pipe size to 6" diameter. |
| 100 | FS-GA-0091 | 3C Four inch water line is noted as 6 inch line in FS-GA-0230. T.SH.SCS.058 | Agree. Will update pipe size to 6" diameter. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 32

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

101 FS-GA-0091 SECTION A-A
Change water supply line size to 6
inches to agree with pipe table on Dwg.
FS-GA-0230.

T.SH.RLT.010

Agree. Will revise pipe size to 6" diameter.

102 FS-GA-0091 B6
The space for future loading chute will
interfere with the Excavation Effects
Test extensometer instrumentation.
Delete.

G.SH.TLL.017

See Response to Shaft Comment #97.

103 FS-GA-0095 C5
Locating the bottom of the shaft 50 ft.
below the MTL will interfere with the
Excavation Effects test. Increase to a
minimum of 100 ft.

G.SH.TLL.021

Disagree. After elimination of CHDR (Ref.
ECR-022, 023, 024 and 025), the shaft bottom
of 50 ft. Below the MTL has been
established to accommodate the conveyance
overtravel. Additional ECR must be issued
for revision of present shaft configuration.

104 FS-GA-0095 C6, FS-GA-0150 A4, A5
Indicate conceptually the outline of the
proposed future loading chute.

R.SH.DLK.031

Disagree. Will delete loading chute cutout.
No upper breakout level expansion requiring
this installation is currently in the
baselined criteria documents.

105 FS-GA-0100
Increasing the size of the plenum from
the 50 percent status reduces the
cross sectional area for the available

Disagree, the ES-2 plenum has gained 3 square
ft. area while ES-1 has lost 3 square ft.
Overall, the airflow of the system has
slightly increased because of the increase

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 33

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | <p>intake air flow in the remaining shaft area. At a 2000 fpm velocity limit, this reduces the maximum flow capability of the system. Return to a smaller plenum as in the 50 percent status. J.SH.LJO.001</p> | <p>cross sectional area of the plenum. Refer to Ventilation Comment #2.</p> |
| 106 | | <p>FS-GA-0100 The method of attaching the short cross buntions to the long steel buntion, provides less alignment potential than the 50 percent status. Also since access to the backside of the buntion is not available, it appears the attachment and inspections will be more complicated than the 50 percent status. Return to the 2 buntions from wall to wall and determine a more suitable solution to other comments which resulted in this change. This is especially important for high speed hoisting. J.SH.LJO.022</p> | <p>Preliminary design of connection details was performed to establish necessary adjustments for alignments and clearances of the revised shaft cross section as presented for 100% Title I. The diameter clearance is available at the backside of the long buntion for tightening bolts and inspection.</p> |
| 107 | | <p>FS-GA-0100 The long cross buntion reduces the flexibility of the system by limiting the maximum size of gear the shaft can pass. The 50 percent status allowed,</p> | <p>Disagree. The size of the gear that can pass through the shaft is the same in both configurations. To remove the plenum wall from collar to MTL, to allow larger gear passage is not practical or a feasible</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 34

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

with the removal of the plenum for more space and, therefore much larger gear passage. Change to an arrangement which provides the flexibility of the 50 percent status.

J.SH.LJO.023

108 FS-GA-0100

The compressed air and dewatering lines now located in the conveyance travel path should be relocated out of the way since they increase the potential that the emergency escape bullet may hang up or gear suspended under the skip may contact shaft furnishings.

J.SH.LJO.024

109 FS-GA-0100 SECTION A-A

The position of the bell cord does not allow a person in the cage to pull it.

N.SH.DGM.001

110 FS-GA-0100 6C

Four inch water line is noted as 6 inch line in FS-GA-0230.

T.SH.SCS.059

assumption.

Agree. Will relocate air and water pipes.

Agree. Will relocate bell cord.

Agree. Will update pipe size to 6" diameter.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 35

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|--|
| 111 | FS-GA-0100 | SECTION A-A Change water supply line size to 6 inches to agree with pipe table on Dwg. FS-GA-0230. T.SH.RLT.011 | Agree. Will update pipe size to 6" diameter. |
| 112 | FS-GA-0102 | DETAIL 1 Give detail of the ground support at the brow. R.SH.WHG.016 | Agree. Will detail in Title II. |
| 113 | FS-GA-0102 | NOTE 4 Give details of the type of rock bolts required. R.SH.WHG.015 | Title II item. |
| 114 | FS-GA-0102 | R/B Identify the areas in the shaft liner concrete that require reinforcing steel to assist in tension loading. F.SH.JAJ.003 | Will detail in Title II. |
| 115 | FS-GA-0110 | The off center shaft station does not allow adequate access between the rib and the muck handling facilities. Move shaft to center of station. J.SH.LJO.015 | Disagree. No access is necessary on both sides of the shaft and along the drift. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 36

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|---------------|--|--|
| 116 | FS-GA-0110 5C | Identify method of removal of cover for spillage dump. Show handles or lifting ears/lugs. T.SH.SCS.060 | Agree. |
| 117 | FS-GA-0112 | No bell cord is shown on the drawing extending to the bottom of the shaft into the sump area. N.SH.DGM.003 | Agree. Bell cord will be extended to the shaft bottom. |
| 118 | FS-GA-0112 | REV. B | Agree. |
| | | No communication cables, air or dewatering lines, and power cables are shown on the drawing. N.SH.DGM.004 | |
| 119 | FS-GA-0113 | Station width at shaft location does not agree with other drawings. The widened out passageway may be unnecessary if the shaft and station are centered. J.SH.LJO.014 | Drawing FS-GA-0113 will be updated to conform with station Dwg. FS-GA-0110. The widened out passage way will be used by a small LHD to transport the muck to the surge bin grizzly during the excavation of the demonstration breakout at the Main Test Level. |
| 120 | FS-GA-0113 | Installation of ducts and other utilities over shaft and loading | Comment needs clarification. Ducts are installed in accordance with standard mining practice. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 37

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|---|
| | | <p>pocket is more dangerous than from a drift floor.</p> <p>J.SH.LJO.040</p> | |
| 121 | FS-GA-0113 | <p>B1, B2, C1, C2</p> <p>The design of the ES-2 shaft bottom spillage arrangements should consider a malfunction of the gate on the 10 ton measuring flask, allowing 10 tons of rock to fall into the spillage hopper. The current design would not allow removal of the 5 ton spillage box without a considerable amount of rock falling into the pump sump.</p> <p>K.SH.DW.013</p> | <p>The probability of dumping measuring flask is very low during 5 year operation. If malfunction of the gate on the 10 ton measuring flask occurs, allowing 10 tons of rock into the spillage hopper, then the rocks will be manually shoveled to a bucket and hoisted back to the loading pocket. This will be done repeatedly until the spillage hopper is cleared enough to be hoisted to the loading pocket.</p> |
| 122 | FS-GA-0113 | <p>Spillage collection and handling system is inefficient and prone to muck spillage burial.</p> <p>T.SH.SCS.061</p> | <p>Disagree. Level alarm or load cell will be installed at the spillage collection box support to alarm the hoist operator regarding overloading of the box. Regular inspection shall be performed during operation.</p> |
| 123 | FS-GA-0113 | <p>7C</p> <p>Eliminate gate actuator mechanism used on spillage bucket in favor of a simple tipping bucket. This is a safer and more easily maintainable design (T.F.SS.032).</p> | <p>Disagree. The gate actuator is simpler and safer to operate. Gate design is similar to concrete bucket used in construction industry.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 38

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|---|
| | | T.SH.SCS.004 | |
| 124 | FS-GA-0113 | It is recommended that all underground self-propelled equipment be protected with a built-in automatic fire extinguishing system which can also be activated manually. | Agree. All mobile equipment will include these fire protection features. |
| | | R.SH.JLB.013 | |
| 125 | FS-GA-0113 | GRID A-7 Adequate protection from falls is needed for ladder at the top of the 150 ton surge bin to meet MSHA regulation for fixed ladder landings (See 30 CFR 57.110066) because the ladder does not extend at least 3' above the landing. A/E should revise drawing as appropriate. (This comment was identified as T.F. SP.015 and listed as F-179 in the 50 Percent Design Review Report). | Agree. Ladderway will be provided with hinged cover and hand hold bars, same as for MTL Station on Shaft ES-1 (FS-GA-0091). Note will be added on the drawings. |
| | | T.SH.SWP.016 | |
| 126 | FS-GA-0113 | 0062, 0095, 0102 The submersible pump should rest on a full face shaft bottom and be provided with an angled deflector plate mounted above for protection. | Agree. The submersible pump sump will be deleted. Pumps will be located on full face shaft bottom. Pumps will be protected with overhead grating located at crash beam level. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 39

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|--|
| | | <p>The pump, as shown, in a small box hole, without protection is operationally problematical.</p> <p style="text-align: right;">R.SH.DLK.024</p> | |
| 127 | FS-GA-0113 | <p>REV B GRID B-1 The submersible pump needs some protection. Where the pump is now, it will be damaged and buried by muck spillage, and will be hard to maintain.</p> <p style="text-align: right;">A.SH.SDF.012</p> | <p>Disagree. The pumps sitting in a 4' x 6' x 6" sump pit are protected by a removable floor grating as shown on Section H-H Drawing FS-GA-0112. Drawing FS-GA-0113 will be revised accordingly.</p> |
| 128 | FS-GA-0113 | <p>ZONE C7 The grizzly to the right of the dump wall in FS-GA-0113 could too easily become blocked with oversize material because:</p> <ul style="list-style-type: none"> o grizzly is small (only about 6 ft. in smaller dimension). o up to 10 percent of the muck is permitted to exceed the 12" x 12" spacing of the grizzly bars. o the grizzly is not sloped away from the dumping position (which on a | <p>Agree. Grizzly will be enlarged from 6 ft. to 9 ft. in the smaller dimension and will be sloped to permit the LHD bucket to scoop the oversized material out of the grizzly if the air hammer or rock breaker fails to do the job. Revisions will be made during Title II design.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 40

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | <p>larger grizzly would allow oversize to collect on far side of grizzly for periodic breaking up with an air hammer).</p> <p>Suggest dump wall be moved and/or grizzly be enlarged so that grizzly right of dump wall is at least 9 ft. in smaller dimension.</p> <p style="text-align: right;">T.SH.DMR.018</p> | |
| 129 | | <p>FS-SP-0201 Delete reference document ESF Project QAPP.002 Quality Assurance Program Plan. This is an F&S document, not DOE/NV nor consensus, public document.</p> <p style="text-align: right;">R.SH.MAF.012</p> | <p>Agree. F&S QA Document will not appear as a DOE reference.</p> |
| 130 | | <p>FS-SP-0201 PAGE 1, SECTION 1.2.1 Change 29CFR 1986 to 29CFR 1926.</p> <p style="text-align: right;">T.SH.EMC.027</p> | <p>Agree.</p> |
| 131 | | <p>FS-SP-0201 PART 2.1 Equipment for fastening lining to sump and floor should be added.</p> <p style="text-align: right;">A.SH.SDF.019</p> | <p>There was an error in the comment. It should have referred to FS-SP-0701. The response to comment No. 58 (J.SH.LJO.044) adequately addresses this issue.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 41

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|--|
| 132 | FS-SP-0201 | 2.2, PAGE 2 Reference to "FS-SP-0603" (which does not exist in the current list of specs) should be changed to "FS-SP-0503". R.SH.LGC.001 | Agree. Reference is "FS-SP-0503." |
| 133 | FS-SP-0201 | PAGE 2, SECTION 2.2 Change FS-SP-0603 to FS-SP-0503. T.SH.EMC.028 | Agree. |
| 134 | FS-SP-0201 | 3.1.1, 3.1.2 PP.2 & 3 Cross references to FS-SP-0205 should be specific in subparagraphs to which paragraphs in 0205 apply. For instance: a) "Minimize Drill Water Use" (in 3.1.1) and "Minimize Water Usage" (in 3.1.2) apparently refer to 0205, 3.6. and b) "Hole Patterns" refers to 0205, 3.5.2 "Drilling Patterns". Make paragraph headings consistent. R.SH.LGC.002 | Disagree on cross-referencing. Entire "Controlled Drilling and Blasting" specification applies to paragraph 3.1.1 and 3.1.2. Agree, however to make subparagraph headings consistent. |
| 135 | FS-SP-0201 | PART 3.1.4 ADD THIS BULLET *Shaft mapping. *Radial borehole. A.SH.SDF.016 | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 42

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
 F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|---|
| 136 | FS-SP-0201 | PAGE 3, 3.1.5 Muck handling may require dust control. Add section for dust control. T.SH.THP.017 | Agree. Will include requirements for dust control during muck cycle. |
| 137 | FS-SP-0201 | Add before paragraph 3.2, a paragraph on "TEST SUPPORT PRIOR TO CONCRETE PLACEMENT" o Geologic Mapping o Location Markers G.SH.TLL.005 | Agree. Will add scheduling: 3.1.6 Test Support prior to concrete placement. |
| 138 | FS-SP-0202 | PAGE 1, SECTION 1.1 Add words that this work occurs below the collar. T.SH.EMC.029 | Agree. |
| 139 | FS-SP-0202 | 1.2.3, PAGE 1 Same comment as for 0201, 1.2.3. R.SH.LGC.004 | Agree. |
| 140 | FS-SP-0202 | PAGE 3, PART 2 Sections 2.1 and 2.2 should be moved to Part 3 just as they are in FS-SP-0203. T.SH.EMC.030 | Agree. These sections for Alignment and Overbreak and Underbreak belong under Part 3 - Execution. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 43

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|---|
| 141 | FS-SP-0202 | 3.1,3.2,3.3, PP 3&4 Same comment as for 0201,3.1.1 and 3.1.2. R.SH.LGC.005 | o Disagree on cross-referencing. Entire "Controlled Drilling and Blasting" specification applies to paragraph 3.1 and 3.2, however it says nothing about 3.3, Scaling and Ground Support. o Agree. Will make subparagraph headings consistent. |
| 142 | FS-SP-0202 | PART 3.5 ADD THIS BULLET, PART 3.6.1 *Shaft mapping. Delete "hydrochemistry test"; Add "sample management facility". A.SH.SDF.017 | Disregard reference to Part 3.5 Shaft Mapping. F&S will substitute "sample management facility" for "hydro chemistry test" on Part 3.6.1. |
| 143 | FS-SP-0202 | PAGE 5, 3.6 Muck handling may require dust control. Add section for dust control. T.SH.THP.016 | Agree. Will include requirements for dust control during muck cycle. |
| 144 | FS-SP-0203 | PAGE 1, SECTION 1.1 Add words that this work occurs below the collar. T.SH.EMC.031 | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 44

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------|--|--|
| 145 | FS-SP-0203 | 1.2.3 PAGE 1 Same comment as for 0201, 1.2.3. R.SH.LGC.006 | Agree. |
| 146 | FS-SP-0203 | 3.3.1 PAGE 3 Add "flow meter" to determine water used. G.SH.MSW.013 | Disagree. Total water balance will be accomplished at surface level. |
| 147 | FS-SP-0203 | 3.3, 3.4, AND 3.5 Same comment as for 0201, 3.1.1 and 3.1.2. R.SH.LGC.007 | o Disagree on cross-referencing. Entire "Controlled Drilling and Blasting" specification applies to paragraph 3.3 and 3.4. It does not apply to paragraph 3.5, Scaling and Temporary Support. o Agree. Will make subparagraph headings consistent. |
| 148 | FS-SP-0203 | PAGE 5, 3.8 Add section for dust control. T.SH.THP.018 | Agree. |
| 149 | FS-SP-0301 | Structural forms for containing and thus forming concrete for the shaft liner are considered tools or construction aids, not "items" that will remain in the shaft or serve an operational function. It is unlikely that such | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 45

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|----------------|---|--|
| | | <p>"tools" will be assigned a QA level. Identify the QA level as "TBD". F.SH.JAJ.018</p> | |
| 150 | FS-SP-0301 | <p>State requirement for qualified welding equipment, qualified procedures, and qualified welders and/or inspectors. R.SH.MAF.013</p> | Agree. Will add requirements for welding in specification. |
| 151 | FS-SP-0301 F&S | <p>Second sentence of third paragraph should be revised to delete subparagraphs for dimensional tolerances and read as follows: "Dimensions shall be measured at 70 degrees Fahrenheit (+/- 10 degrees) and shall be in accordance with certified drawings." R.SH.LGC.008</p> | Agree. |
| 152 | FS-SP-0308 | <p>PAGE 1, SECTION 1.2.1 Since the shaft liner is mostly unreinforced, add to the list of references ACI 318.1, Building Code Requirements for Structural Plain Concrete. T.SH.EMC.032</p> | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 46

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Shaft

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

153 FS-SP-0308 PART 3
A minimum time and distance should be
specified before blasting resumes.
A.SH.SDF.018

The minimum distance from the bottom of forms
to the shaft bench shall be 20 feet.
Blasting shall not resume before concrete has
taken its initial set.

154 FS-SP-0308 PAGE 5, SECTION 3.8
State a minimum acceptable sampling
frequency. This should not be solely
at the direction of the Contracting
Officer.
T.SH.EMC.033

Agree. Minimum acceptable sampling shall be
no more than seven cylinders from batch
delivered to the site. Complete requirements
to be amplified in Title II.

155 FS-SP-0503 PAGE 3
More information is required concerning
the installation of anchor bolts and
embedded items (including any drilling
of holes in the forms, attachment of
items to the forms). A survey plan
(including a precise check on the
location of each of these items, prior
to pouring concrete) is also required.
Suggested sub-section headings
include:

o Inspection of Anchor Bolts - particular
bolts and embeds will be specified per
industrial standards (i.e., A307 bolts or
ferrule type insert, minimum capacity....),
and they should not require inspection.

o Survey Plan - will be shown as a developed
elevation on the drawings.

o Installation - will be detailed on the
drawings.

o Inspection of Installations - will
incorporate under Part 3 - Execution.

o Inspection of anchor bolts and other
items to be embedded, and fasteners.

o Survey Plan (to locate items to be
'nstalled).

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 47

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|------------|
| | | <ul style="list-style-type: none"> o Installation (including fastening, blocking). o Check Survey (including alignment and tolerances) prior to pouring concrete. o Inspection of installation. | |
| 156 | FS-SP-1407 | <p>Change last sentence of paragraph 1.3 from "... shaft wall mounting." to "... shaft wall mapping."</p> <p>T.SH.DMR.019 G.SH.TLL.006</p> | Agree. |
| 157 | FS-SP-1409 | <p>1.3 PAGE 2 In second sentence, delete "by others". Contractor/Subcontractor is responsible for the installation of the system and may or may not require "vendor" to install it. "By others" could confuse the Subcontractor as to who is responsible for the "excavation".</p> <p>R.SH.LGC.009</p> | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 48

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
 F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|---|
| 158 | FS-SP-1409 | <p>THROUGH 1414 Under Part 3 - Execution suggest adding the following sub-section headings to the indicated specifications:</p> <p>a. Dimensional Inspection/Tolerances to 1409, 1411, 1412, and 1413.</p> <p>b. Testing (and Acceptance) to 1411, 1413.</p> <p>c. Periodic Inspection, Maintenance, and Testing Program to 1414.</p> <p style="text-align: right;">T.SH.DMR.020</p> | <p>a. Agree. b. Agree. c. Disagree. This is a maintenance item not applicable to procurement.</p> |
| 159 | FS-SP-1414 | <p>1.3 Hoist rope length must include allowances for cut-offs.</p> <p style="text-align: right;">T.SH.IRC.010</p> | <p>Agree. Will amplify the system description for Title II.</p> |
| 160 | FS-SP-1416 | <p>Add paragraph to Part 3 to provide for access to shaft wall instrument locations after installation of shaft equipment.</p> <p style="text-align: right;">G.SH.TLL.007</p> | <p>Agree. Will include sub-heading as "Access to Test Instrument Locations."</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 49

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Shaft

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------|--|------------|
| 161 | FS-SP-1418 | 1.3 500 fpm is too high for emergency hoisting - 50-100 fpm should be max. T.SH.IRC.011 | Agree. |

COMMENT RESOLUTION SHEET

Page 1

JES0101
7/88

Document Originator F&S
Date 8/8/88
Document Title ESF 100% Technical Review
Title I.
Ventilation
Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson [Signature] Date 9/15/88
QA [Signature] Date 9/15/88
A/E [Signature] Date 9-16-88
WMPC [Signature] Date 9/16/88

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 2

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Ventilation

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

1 FS-GA-0225
Outer vertical drifts are inclined.
Future changes in drift configurations
(see comment on FS-GA-0160) will have
impact so changes to reflect incline
alone may not be justified at this
time.

L.VE.DGW.012

2 FS-GA-0225
Comment from 50% review, "The return air
plenums are not only a maintenance
item, but also restrict cage size and
the size of equipment, which can be
transported therein. I suggest that the
logic and rationale for having return
air plenums in each shaft be
reexamined and the results documented as
a trade study".

The response to this comment was that
the need would be documented.
However, documentation has not yet been
provided. The reference to a 1986 DOE
white paper does not satisfy this
comment. As an alternative to a trade
study, the appropriate documentation
could be included in the Title I design
report.

Agree. No further action needed.

Standard response to comments on Flow-through
ventilation versus Exhaust Duct System.

The comparative logic and rationale of using
exhaust duct ventilation over that of flow
through system has been explained in the
workshop and is hereby documented:

There are two most feasible ventilation
systems for the ESF, namely:

Option 1. Flow Through Ventilation - The
system will use ES 1 as the fresh intake air
shaft and ES 2 as the exhaust air shaft. An
underground primary fan at the main test level
will move the ventilating air.

Option 2. Exhaust Duct System in each Shaft -
The system allows the fresh intake air to go
through both ES 1 and ES 2 shafts. A

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 3

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Ventilation

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---------------------|---|
| | | T.VE.ALL.003 | <p>inside each shaft is a structurally reinforced metal duct used as a separate exhaust airway. Primary exhaust fans in the duct move the ventilating air as shown in drawing #FS-GA-0225.</p> <p>The choice is Option 1 based on the following reasons:</p> <ul style="list-style-type: none"> o Simple system with minimum leakages o Less energy cost o Less capital cost o Less maintenance cost o More space available in the shaft o Visual inspection and maintenance of shaft liner, guides, buntons, etc. are easier. <p>To accommodate flow through ventilation, the ESF project will have to follow a sequential schedule such as:</p> <ul style="list-style-type: none"> o Construction of both ES 1 and ES 2 shafts at relatively the same sinking rate |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 4

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Ventilation

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---------------------|---|
| | | | <ul style="list-style-type: none"> o Connection of both shafts at the main test level with a 10' x 10' drift (maximum size of drift that can be ventilated by the 20" diameter ducts used in shaft sinking) o Construction of a runaround from the connecting drift for the underground primary fan space (a variance from the California less is required for this) o Installation of the underground primary fan and airlock to operate the flow through ventilation o Site characterization of the ESF will follow. <p>The objective of the ESF is site characterization, and a ventilation system that is adequate to support site characterization. It is apparent that Option 1 is a better alternative but its accommodation can support site characterization objectives only after the ventilation system is placed in operation. The choice of Option 2 is based upon the following:</p> <ul style="list-style-type: none"> o The system can support various ESF |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 5

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Ventilation

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

3 FS-GA-0225 RV.B
Extensive experience with many sizes and applications of duct-type ventilation systems at the NTS have shown them to be expensive to install and maintain, inherently noisy, constantly prone to leaks and recirculation, and very inefficient in terms of air moved for the power required (when compared to ductless [flow through] systems). In general industry applications, the high resistance inherent in duct-type vent systems has resulted in their use essentially as auxiliary systems to solve local ventilation problems adjacent to primary ventilation airways.

characterization activities during shaft construction and main test level development.

- o It is constructible and maintainable
- o It satisfies the SDRD and other requirements imposed on the project.

The system will be re-evaluated during the safety analyses during Title II.

Part 1. Agree.

Part 2. Disagree. Current criteria and requirements are satisfied by the design as presented.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 6

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Ventilation

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|--|
| | | <p>Any duct-type system that can be eliminated will improve the operation for the reasons stated above. E.VE.SAT.002</p> | |
| 4 | | <p>FS-GA-0227 Show alternative for development of MTL after shaft to shaft connecting but without benefit of ES-1 vent system if testing delays final equipage of ES-1 shaft. R.VE.WHG.026</p> | <p>Ventilation modifications, can be made if parameters are clearly defined. Alternatives must consider the status of the MTL activities. With the present ventilation system alternatives are not required for this situation. Will develop in Title II if the development schedule indicates the alternative is necessary.</p> |
| 5 | | <p>FS-GA-0227 Fresh air should flow over the power center and return through duct work. The way it is set up now, if a fire occurs in the power center, smoke would be coursed through the mine. M.VE.JW.004</p> | <p>Disagree. The power center has limited combustible material to burn, being dry type transformers. The center is also provided with automatic fire suppression system to prevent the spread of fire. Providing a separate return duct is not a requirement, and is not an industry practice.</p> |
| 6 | | <p>FS-GA-0227 R/B Delete Note 4; it is misleading. The note implies that the design will not (eventually) describe the ventilation system in any greater detail than shown here. It also implies that the</p> | <p>Disagree. The note covers flexibility of the system to adapt to approved changes as required in the project. The actual day to day ventilation of a developing mine involves a series of transitions to meet specified requirements of advancing drifts. Th can</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 7

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Ventilation

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | <p>system will be "modified...in the field as required". Neither of these implications can be accurate. F.VE.JAJ.006</p> | <p>not be shown in details by drawings. However, much more detail will be included in the Title II drawing package, Note 4 will be changed with the addition, "through approved changes."</p> |
| 7 | | <p>FS-GA-0228 The basis for the fire control system must be contained in the fire control plan. This plan must address several credible fire scenarios. The plan must recognize that fire doors may not function and that the design should consider the consequences of such a malfunction. K.VE.JEM.004</p> | <p>Agree. Specific fire control plan and evacuation procedures to address credible fire scenarios will be included in Title II design. To PP 6 - end of Item 5.</p> |
| 8 | | <p>FS-GA-0228 C-4, C-6 The minimum airflows shown for sequential drift #2 and the demonstration breakout drift, 12,500 cfm and 16,000 cfm respectively, are less than needed to satisfy the 60 fpm criteria. These quantities are also lower than those shown in F&S calculation, FS-CA-0030. Please correct drawing or provide explanation. T.VE.ALL.002</p> | <p>Agree. Title II drawings will include adjustment of air quantities per F&S calculation, FS-CA-0030.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 8

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Ventilation

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------|---|---|
| 9 | FS-GA-0228 | <p>C3, C7 The booster fans should be mounted in such a manner that return air from the faces of the exploratory drifts is confined to the exhaust ducting. Any other arrangement will direct return air through working areas, increasing the potential for worker exposure to hazardous dust and diesel exhaust components.</p> <p style="text-align: right;">B.VE.BC.003</p> | <p>Agree. Note 4 will cover this concern to read, "Fan and tube blowing air to the face can be repositioned for a reversed air flow during a development phase. The fan then becomes a primary booster of the main exhaust system."</p> |
| 10 | FS-GA-0228 | <p>C5 Dust control at the ES-2 dump pocket appears to be very difficult since 164,000 cfm of fresh air is being directed through this area. The high velocity will pick up dust and carry it along the fresh air stream. a regulator should be placed in this location to reduce the velocity or the air stream should be reversed so that all air over the dump goes directly to exhaust.</p> <p style="text-align: right;">K.VE.JEM.003</p> | <p>An appropriate dust control will be engineered for the dumping station as soon as details of the dump pocket are established.</p> |
| 11 | FS-GA-0228 | <p>RV.B Experience at the NTS has shown that fewer fans with vent-line controls allow a quieter, more easily maintained</p> | <p>Disagree. The required air volume to maintain each drift with 65-70 fpm minimum design air velocity will require a large duct which with hinder accessibility of the main d t.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 9

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Ventilation

**COMMENT
NO.**

PAGE

REVIEWER'S COMMENTS

RESOLUTION

system. An example could be the "sequential drifts, where a single fan of appropriate size could serve the 3 drifts (and be extended to serve the waste package drifts as well) through a modified design utilizing appropriate ducting, dampers, etc.

E.VE.SAT.003

It will also require a high volume and relatively high pressure single fan that will be much noiser than the present proposal.

COMMENT RESOLUTION SHEET

Page 1

NES0101
7/88

Document Originator F&S

Date 8/8/88

Document Title ESF 100% Technical Review

Title I

Piping & Instrumentation

Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson [Signature] Date 9/15/88

QA [Signature] Date 9/15/88

A/E [Signature] Date 9-16-88

WMPO [Signature] Date 9/16/88

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 2

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Piping & Instrumentation

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------------------|---|---|
| 1 | FS-GA-0220 THRU 0225 | <p>It is noted that several parameters are being monitored by the life safety and operations control. The workshop discussion indicated that the selection of monitored parameters are not necessarily supported by analysis. Because many of these systems are QA Level II, it is recommended that the life safety and operations control be fully integrated with operational emergency response. Additionally, the system features must be supported by safety and reliability analysis. After the analyses are performed, the SDRD should be amended accordingly to document the basic conclusions developed by the analysis.</p> | <p>Agree. All systems not required by the SDRD will be supported by further analysis.</p> |
| 2 | FS-GA-0220 | <p>Calls out a "Central Control Room". This appears to be the same as the "Life Safety and Fire Control" room in the Change House Building 6008. Perhaps the same nomenclature should be used in both packages.</p> | <p>Agree. Will rename.</p> |
| | | T.PI.IRC.002 | |
| | | A.PI.TJM.003 | |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 3

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Piping & Instrumentation

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|--|
| 3 | B | <p>FS-GA-0220</p> <p>Some of the compressed air and water systems instrumentation appear unnecessary for cost effective and safe system operation. There is the likelihood that the monitoring and control systems themselves could shut down operating equipment and systems just for the maintenance of the monitoring and control systems. Provide the safety and reliability analysis that justifies all of the detailed monitoring and control devices for the compressed air and water systems.</p> <p>R.PI.DLK.028</p> | <p>Agree to the first sentence of the comment. Compressed air and water system instrumentation will be reviewed and revised for Title II design.</p> |
| 4 | | <p>FS-GA-0220</p> <p>Subsurface booster compressor is mobile and may not be conducive to installation of remote monitored instrumentation. Delete these instruments from consideration.</p> <p>R.PI.WHG.025</p> | <p>Disagree. All instrumentation and control for booster compressor is local. See Note 5, FS-GA-0220.</p> |
| 5 | | <p>FS-GA-0220</p> <p>Los Alamos needs to generate an ECR to define the common data weather parameters that will be used for water balance calculations with respect to</p> | <p>General directions from WMPO and interface meetings between A/E and Los Alamos is required to clarify areas of responsibility.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 4

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Piping & Instrumentation

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|--|
| | | <p>ventilation. Provision for these measurements is assumed to be needed in the headframe. The responsibility for all weather measurements was assumed to reside with SAIC.</p> <p style="text-align: right;">A.PI.TJM.004</p> <p>6 FS-GA-0221 B Some of the hoist systems instrumentation appear unnecessary for cost effective and safe hoist system operation. There is the likelihood that the monitoring and control systems themselves could shut down operating equipment and systems just for the maintenance of the monitoring and control systems. Provide the safety and reliability analysis that justifies all of the detailed monitoring and control devices for the hoist systems.</p> <p style="text-align: right;">R.PI.DLK.029</p> <p>7 FS-GA-0222 Note #4 - 30LFR57.5037 Note #5 - 10CFR60, 10CFR57 The drawings do not conform (not compatible) to the NTS drawing note requirements described in the DOE directive, issued by the DOE/NTSO Director to all NTS</p> | <p>Agree to the first sentence. FS-GA-0221 will be reviewed and revised for Title II design.</p> <p>Disagree to the comment on Note 4 since the codes and applicable paragraphs are indicated. Agree to the comment on Note 5. Note 5 will be revised.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 5

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Piping & Instrumentation

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|--|
| | | <p>contractors, NTSO:ON-233 dated 7/13/88 (attached), which states, in part, "Requirements shall be defined by citing individual sections, paragraphs or sentences of the selected code, standard...</p> | |
| | | E.PI.ARV.004 | |
| 8 | | <p>FS-GA-0222 .B GRID D-7 Data on air quality parameters in underground locations will be more meaningful if the same parameters (e.g. oxygen level, carbon monoxide level, nitrogen oxide level) are measured in the surface intake air. This would also warn of toxic gases from a surface fire affecting air quality underground. Modify Life Safety System as appropriate.</p> | <p>Disagree. Subsurface monitoring is provided only as a life safety system for the personnel underground. Monitoring levels are set in such way to trigger the alarm when monitored condition U/G exceeds safe limits regardless of the source (surface or subsurface). Surface monitoring is being designed by H&N.</p> |
| | | T.PI.SWP.005 | |
| 9 | | <p>FS-GA-0222 .B GRID C-4 In the MTL drifts, approximately 60 instruments (or parameters) are specified for measurement of chemical concentrations including carbon monoxide, carbon dioxide, nitrogen oxides, sulfur dioxide, oxygen, and hydrogen sulfide. Automated</p> | <p>Monitoring system is required by SDRD 1.2.6.7.11. The quantity and exact location of sensor - transmitters will be developed during Title II design in order to provide optimal layout to monitor potential life - threatening conditions. Additional non-automated monitoring will be required to evaluate worker exposure to toxic substances</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 6

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Piping & Instrumentation

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

monitoring at fixed locations may not be the most practical method for complying with 30 CFR 57.5001 requirements regarding exposure limits for air borne contaminants. Measurements should be taken at the worker's location to represent inhalation risk. Consider deleting these automated monitoring stations in favor of more flexible, non-automated monitoring, or provide design analysis documentation to support parameters selected and locations for instruments.
T.PI.SWP.024

10 FS-GA-0222 B
Some of the ventilation systems instrumentation appear unnecessary for cost effective and safe vent system operation. There is the likelihood that the monitoring and systems themselves could shut down operating equipment and systems just for the maintenance of the monitoring and control systems. Provide the safety and reliability analysis that justifies all of the detailed monitoring and control devices for the ventilation systems.
R.PI.DLK.

according to 30 CFR 57.5001, 5002.

Monitoring system has no features that might shut down the ventilation system under any conditions. The instrumentation and remote controls for ventilation will be reevaluated by 30% design to establish minimum requirements for safety and operational flexibility.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 7

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Piping & Instrumentation

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|--|
| 11 | FS-GA-0222 | The need for monitoring on a continuous basis for NOX, NO2, SO2, O2, and H2S should be re-examined. Many of these are the result of fires which can be detected by measuring CO or CO2. K.PI.JEM.010 | This would be in violation of SDRD requirement 1.2.6.7.11. Continuous monitoring of the gases is essential to life safety. This will be investigated further in Title II. |
| 12 | FS-GA-0222 | Upper left corner shows a cont. stench warning system. No other mention is made anywhere else in the system. Please explain. N.PI.DGM.002 | It is shown on the H&N DWG. FP5.B F-9 Quadrant. The system is considered necessary as a reliable back-up mechanical alarm system. Details for this system will be developed and shown on Mechanical and Instrumentation Drawings for Title II design. |
| 13 | FS-GA-0230 | All valves controlling water that will supply fire protection systems must be electrically supervised, with the supervisory alarm and trouble signals annunciated with the fire alarm signals on the fire alarm panel. This will require a review of all drawings showing the water system and will require a revision of the symbols drawings to show supervised valves in accordance with NFPA 172. Other symbol revisions may be necessary. N.PI.PEP.058 | Agree. "All Valves" is a TBD at this time. The complete Mine Water Supply and Distribution System is undergoing a safety analysis and is to be completed in Title II Design to determine if all, or only parts of the piping system components should comply with fire protection codes and standards. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 8

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Piping & Instrumentation

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

14 FS-GA-0230 ZONES D-4 AND D-7
Delete all items on supply side of
interface points, except for "water
supply" and flow direction arrow (see
Dwg. FS-GA-023, Zones D-5 and D-7 as
example). Deleted components are H&N's
responsibility and should appear on H&N
drawings.
T.PI.RLT.002

Disagree. The water taps for surface users,
and the water meters, are shown for system
completeness and clarity. They also help
define the F&S/H&N interface location.
Additionally the water meter is shown to
include all components in the utility
tunnels. All items on the supply side of the
interface will have the notation "By
others."

15 FS-GA-0235
No drainage is provided in central
vertical testing drift (see L.I.DW.007-
50% Review) nor is drainage specified
for any of the Waste Package Tests.
L.PI.DGW.005

Agree. Will comply with Appendix B of the
SDRD.

16 FS-GA-0235
No provision for removal of waste water
from inclined downward central vertical
waste package test drift (see
L.I.DW.007-50% Review).
L.PI.DGW.013

Agree, will comply with Appendix B of the
SDRD.

17 FS-GA-0240
A booster compressor is shown for test
drilling in horizontal waste package
test. It is not clear whether similar
booster would be required in waste

Disagree. Please note that the "Booster
Compressor" denotation on FS-GA-0240
includes the word "(Typical)". One skid
mounted Booster Compressor will be used for
all high pressure drilling/coring

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 9

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Piping & Instrumentation

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

package vertical tests since the drilling is the same. No test drilling is allowed in the horizontal waste package drift other than for the WPET itself.

L.PI.DGW.014

18 FS-GA-0240
 COMPRESSED AIR SYSTEM SCHEMATIC FLOW DIAGRAM

It is recommended that gate valves be installed as needed on both air lines from ES-1 to ES-2, so that shutdowns in the system may occur at various places along the line rather than going back to ES-1 or ES-2. This would expedite shutoff time in case of emergency. Existing valves are now at each end of the system.

R.PI.FAS.009

19 FS-GA-0240 .B
 Designate on the schematic the compressed air line which supplies refuge area.

T.PI.SWP.025

requirements. This is described in an F&S Design Analysis (FS-CA-0034) which is available for review.

Agree. Additional isolation valves will be included in Title II, when more detailed information is known on compressed air requirements for testing.

Agree. The double source of air supply to "Service Drift No. 2" (Location B-4 on FS-CA-0240) is for the refuge area. The wording will be revised to include "Refuge Area" in Title II when the refuge area is fixed and shown on Dwg. FS-GA-0006.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102-
7-88

Page 10

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Piping & Instrumentation

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--|---|--|
| 20 | FS-GA-0240 | <p>RV.B Experience at the NTS has shown that fewer, larger compressors are a successful approach for a given requirement. A typical installation is 3 compressors (one or two provide the design requirement with a standby compressor).</p> <p>E.PI.SAT.004</p> | <p>Agree. Title II will include an analysis on air compressor selection. Current DWGS. show 1500 SCFM units in an effort to utilize two GFE units designated for NNWSI use. The remaining units required for system peak demands will be selected based upon the aforementioned analysis.</p> |
| 21 | FS-GA-0240 | <p>ZONES C-3 AND C-7 Change "surface utility air for ES-1 hoist" and "surface utility air for ES-2 hoist" to read: "surface utility air for ES-1 collar area" and "surface utility air for ES-2 collar area".</p> <p>T.PI.RLT.015</p> | <p>Agree.</p> |
| 22 | <p>FS-GA-0243 SURFACE COMPRESSED AIR SYSTEM PLAN & ELEVATION</p> | <p>Surface compressed air receiver tanks need to have safety relief valves installed. These valves shall be set to prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than 10%. All installations of valv</p> | <p>This is plan view of the compressor layout and excludes details of control, instrumentation, and safety devices. For Title I - the SRV's mentioned are shown on the flow diagram-(FS-CA-0240.) Title II will include detailed DWGS of all system components, including receivers. These detailed drawings will include all attachments and accessories.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 11

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Piping & Instrumentation

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

in the system must comply with 1910.169
(b) (3).

R.PI.FAS.004

COMMENT RESOLUTION SHEET

Page 1

ES0101
7/88

Document Originator F&S

Date 8/8/88

Document Title ESF 100% Technical Review

Title I

Electrical

Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson F. Bull Date 9/15/88

QA W.D. Kammick Date 9/15/88

AE W.D. Wilson for R.L. Bullock Date 9-16-88

WMPO F. Bull Date 9/16/88

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS |
|----------------|------|---------------------|
|----------------|------|---------------------|

| RESOLUTION |
|------------|
|------------|

See Page 2 for start of comments.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 2

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Electrical

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

1 FS-GA-0200 B D7
Provide start-up sequence control to the compressors to assure that they start one at a time and in sequence to prevent excessive electrical power demands during start-up.
R.EL.LJF.003

2 FS-GA-0200 R/B, 0213 R/B
Indicate interfaces with IDS design by reference to IDS or Interface Control Drawings.
F.EL.JAJ.005

3 FS-GA-0200 REV B B4 & B7
For ES1 and ES2, indicate provision for construction power (120/208 volt) for the headframe, collar, and galloway during shaft sinking. Show how construction power will be provided to the galloway.
R.EL.LJF.012

4 FS-GA-0200 REV B B6
ES-1 surface vent fans are 200 hp; but on JS-025-ESF-E4B C8, the ES-1 surface vent fans are 125 hp. Show the same size on both drawings.

Agree. Will be developed during Title II.

Agree. The design interface identification sheets processed by H&N are the basis for the interfaces shown on the drawings referenced. However, this does not necessitate a change to the drawing at this time.

Agree. Will be provided during Title II in the subsurface contract package.

Agree.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 3

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Electrical

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

R.EL.LJF.001

- 5 FS-GA-0201
Does not indicate a waste water pump for inclined vertical waste package test drift. (See L.I.DW.007-50% Review).
L.EL.DGW.016

Current approved design criteria indicates dry construction. If pump is required in revised design criteria, an air operated pump will be utilized.

- 6 FS-GA-0201
Considering the concern with excess water in the shafts/drifts, one spare for the ten waste water pump motor controllers does not seem adequate.
J.EL.RDE.002

Agree. Will provide adequate spares in Title II.

- 7 FS-GA-0201 B C5
Indicate that the U.G. 300 KVA UPS unit will require specific dust, humidity, and ventilation conditions for the proper operation of solid state devices and battery charging components.
R.EL.LJF.004

H&N will provide this information on their detailed U/G UPS drawings and specifications during Title II, interfacing with F&S. A note will reference the H&N drawing.

- 8 FS-GA-0201 REV B 7B AND 6B
Note 5 requires U.G. primary fans to be interlocked to reverse when surface fans reverse. Identify what control wiring system will be used to accomplish this as it will require wire

Agree. This control system will be identified on a Title II drawing.

ESF 100% TECHNICAL REVIEW TITLE I

F&S Electrical

runs from the surface fan controller
to the U.G. primary fan controller.

R.EL.LJF.002

9 FS-GA-0202

Five heaters shown as 5 KW should
indicate that is normal operating
range. Heaters are 10 KW each and may
be operated at that loading for short
periods of time.

L.EL.DGW.007

Agree. Will indicate this on Title II
drawings.

10 FS-GA-0204

The width of the IDS and science shop
drift on Drawing FS-GA-0204 does not
agree with the width shown on Drawing
FS-GA-0160.

R.EL.RRR.015

Agree. Will make drawings consistent.

11 FS-GA-0204

Identify either by note, table, or
dimension lines, the equipment alcove
size(s).

T.EL.SCS.067

Agree. Will provide this on Title II
drawings.

12 FS-GA-0204

Waste package vertical tests are
conducted at the far ends of the
drifts. Horizontal tests are conducted

Power distribution equipment for these tests
will be determined in Title II when further
design criteria is received.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 5

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Electrical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|--|
| | | <p>at the beginning of drifts. Power distribution panels are needed at both ends of drifts.</p> <p>L.EL.DGW.011</p> | |
| 13 | | <p>FS-GA-0204 .B Provide emergency lighting in panel access drifts, Service Drift No. 1, and refuge chamber.</p> <p>T.EL.SWP.019</p> | Agree. |
| 14 | | <p>FS-GA-0204 REV B C4 Provide requirement to install electrical equipment and cabling in panel access drift No. 2 such that subsequent sequential drift mining does not damage equipment or cabling in adjacent areas.</p> <p>R.EL.LJF.011</p> | Agree. Will investigate this matter further during Title II design. |
| 15 | | <p>FS-GA-0206 .B GRID B-7 Spacing of two rows of electrical switch gear five feet apart does not comply with requirements in 29 CFR 1910.303 and the National Electric Code. Widen drift or modify cabinets to obtain adequate spacing.</p> <p>T.EL.SWP.020</p> | Disagree. NEC section 110-34 and 29CFR 1910.303 states that for a 2400 volt phase-to-ground system, the minimum depth of clear working space in front of electric equipment is 3 ft. for live parts on one side and no live parts on the other side. The power center is totally enclosed and we provided 5 ft. spacing which is adequate. Back side spacing of equipment is also adequate since |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 6

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Electrical

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

16 FS-GA-0207
Drawings, such as electrical details for the IDS cable plant, created in both H&N and F&S packages should be coordinated so that they agree.
A.EL.TJM.010

codes state minimum of 30 inches for maintenance.

Agree.

17 FS-GA-0207
Make cable trays open top, open work type. Same reasoning as stated in previous comment on cable trays, drawing JS-025-ESF-W3 (T.EL.SCS.020).
T.EL.SCS.068

Disagree. The reason totally enclosed cable trays are utilized is for RF, EMI, and mechanical protection of IDS cabling as requested by the PI's.

18 FS-GA-0212
HOIST SIGNALING SYSTEMS ONE LINE SCHEMATIC DIAGRAMS

Recommend that an additional signal station be installed in ES-2 between the bottom of the shaft and the MTL. This would give the skip tender adequate means of communication with hoist operator.

The signal pull cord is accessible to the skip loading area allowing the skip tender to communicate, by the pull cord, with the hoist operator.

R.EL.FAS.021

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 7

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Electrical

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

- 19 FS-GA-0213 5C, 5D
The diagram for the hoist signalling system as shown is unclear as to means of operation, check and clarify.
T.EL.SCS.069

The control diagram is correct as shown. The CR control relay is normally energized through the two series normally closed signal switches. The CR contact is open while the CR relay is energized and will close when one or the other series signal switch is opened or pulled, allowing the red light and bell in the hoist operators cab to signal. The CR contact is shown in its normally closed state on de-energization. This mine signal switch set-up will allow a more positive, and smoother signal sequence to be transmitted. Will note on drawing as to the normal state of the CR contact.

- 20 FS-SP-1600 1.4 SUBMITTALS
1.4.1.1 refers to Division 1 submittal requirements. No Division 1 specifications provided for review.
R.EL.LGC.023

Agree, they will be part of the final specification.

- 21 FS-SP-1602
Section 1.4.1 Revise to: The Quality Level Assignments for these 460V AC induction motors are given in the following ESF-QALAS for the following items:

Agree to revision; however Motor Specifications are expected to be integrated into the system specifications for various equipment items.

1. Surface ventilation fans

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 8

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Electrical

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

2. Auxiliary hoisting system
3. Underground ventilation fans
4. Wastewater pumps
5. Sump pumps
6. Booster air compressor

Section 3.2.1 Add "As required by the applicable QALAS".

T.EL.PJK.026

- 22 FS-SP-1602 - 1604 PAGE 4,
FABRICATION
2.2.1 "Vendors code of standard practice" should be submitted for approval or appropriate code cited.
R.EL.LGC.024

Agree. Vendors Code of Standard Practice will be removed and will be included under Submittals required under the Part 1 - General subsection of this specification. Fabrication to applicable code(s) shall always be cited.

- 23 FS-SP-1602 1619, 1.2.2
Delete reference to DOE order 6430.1A, General Design Criteria Manual. Each specification should detail the applicable criteria since most vendors will not have access to the document and it is not feasible to include it

Agree. Will not be part of a procurement document.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 9

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Electrical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|---|
| | | with procurement documents. R.EL.LGC.026 | |
| 24 | FS-SP-1602 | PARA. 1.3.4 Required motor protection needed to meet environmental requirements "dedicated by this project", should be specified here or under Para. 2.1. This would include plating, coatings and finished wireless telemetry system. F.EL.JAJ.022 | Agree. However specific environmental requirements for physical motor protection are expected to be included into each of the equipment specifications per electrical comment #23. |
| 25 | FS-SP-1603 | Section 1.4.1 Revise to "The Quality Assurance Level Assignment for the 4160V AC motors shall be in accordance with the applicable ESF-QALAS". (Explanation - neither fans or compressors have issued QALAS) Section 3.2 Add "As required by the applicable QALAS". T.EL.PJK.030 | a) Agree. Statement to be revised with QALAS which is to be determined, however see response to comment electrical #23 regarding integration of motor specifications to equipment items. b) Disagree. QALAS do not define inspection requirements. They assign the criteria of the QA program. |
| 26 | FS-SP-1603 | 1607,1609,1611-1619 2.2.1 Same comment as for 1602 above. R.EL.LGC.025 | Refer to Electrical #22. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 10

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Electrical

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

27 FS-SP-1604
Section 1.4.1 Revise to "The Quality Assurance Level Assignment for these lighting systems shall be in accordance with the applicable ESF-QALAS".

Section 3.2.1 Ad "As required by the applicable ESF-QALAS".
T.EL.PJK.031

28 FS-SP-1605 SECTION 1.4.1
Change to: "Systems shall be in accordance with the applicable ESF-QALAS".
T.EL.PJK.022

29 FS-SP-1605 SECTION 3.2.1
Add "And as required by the applicable ESF-QALAS".
T.EL.PJK.023

30 FS-SP-1606
Section 1.4.1 Change to: Systems shall be in accordance with the applicable ESF-QALAS.

Section 3.2.1 Add "And as required by the applicable ESF-QALAS".
T.EL.PJK.02

Agree. Statement to be revised.

Disagree. QALAS do not define inspection requirements. They assign the criteria of the QA program.

Agree. Statement to be revised.

Disagree. QALAS do not define inspection requirements. They assign the criteria of the QA program.

Agree. Statement to be revised.

Disagree. QALAS do not define inspection requirements. They assign the criteria of the QA program.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 11

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Electrical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|---|
| 31 | FS-SP-1607 | <p>Section 1.4.1 Change to: The ...Level Assignment... is "shown on the applicable ESF-QALAS".</p> <p>Part 3.2.1 Add - in accordance with the applicable ESF-QALAS.</p> <p>T.EL.PJK.025</p> | <p>Agree. Statement to be revised.</p> <p>Disagree. Refer to Electrical #30.</p> |
| 32 | FS-SP-1609 | 1.4.1 | Agree. Statement to be revised. |
| | | <p>Change to "The Quality Assurance Level Assignment for the 4160/480V MTL Mine Power Center is shown on ESF-QALAS 6.7.1-0002.</p> <p>T.EL.PJK.032</p> | |
| 33 | FS-SP-1609 | 3.2.1 | Disagree. The QALAS do not define inspection requirements. They assign the criteria of the QA program |
| | | <p>Add: In accordance with ESF-QALAS 6.7.1-0002.</p> <p>T.EL.PJK.033</p> | |
| 34 | FS-SP-1611 | 1.4.1 | Agree. Statement to be revised. |
| | | <p>Change to "The Quality Assurance Level Assignment for this equipment is shown on ESF-QALAS" (to be issued).</p> <p>T.EL.PJK.034</p> | |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 12

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Electrical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|--|
| 35 | FS-SP-1611 | 3.2.1 Add - In accordance with ESF-QALAS (to be issued). T.EL.PJK.035 | Disagree. Refer to Electrical #33. |
| 36 | FS-SP-1611 | PARA. 1.4.1 The QA Level for Power Distributin Panels used below the surface should be II per QALA 6.7.1-0002. F.EL.JAJ.021 | Agree. Will revise paragraph to reflect Level II per QALAS 6.7.1-0002. |
| 37 | FS-SP-1612 | 1.4.1 Change to: "The Quality Assurance Level Assignment for the electrical cable systems is shown on ESF-QALAS 6.7.1-0001, 6.7.1-0005, 6.7.1-0007, 6.7.1-0002 AND 6.2.2-0009." T.EL.PJK.036 | Agree. Will revise 1.4.1. |
| 38 | FS-SP-1612 | 3.2.1 Add - In accordance with applicable ESF-QALAS. T.EL.PJK.037 | Disagree. Refer to Electrical #33. |
| 39 | FS-SP-1613 | 1.4.1 Revise to: The Quality Assurance Level Assignment for the instrumentation devices covered by this specification shall be in accordance with the ESF- | Agree. Will revise 1.4.1. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 13

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Electrical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS |
|-------------|------|---------------------|
|-------------|------|---------------------|

| RESOLUTION |
|------------|
|------------|

QALAS of the systems in which the devices are installed.

T.EL.PJK.038

| | | |
|----|--|--------------|
| 40 | FS-SP-1613 3.2.1 Add "Acceptance in accordance with the applicable ESF-QALAS". | T.EL.PJK.039 |
|----|--|--------------|

Disagree. Refer to Electrical #33.

| | | |
|----|---|--------------|
| 41 | FS-SP-1614 1.4.1 Revise to: The Quality Assurance Level Assignment for the Motor Control Centers covered by this specification shall be in accordance with the ESF-QALAS of the systems in which the MCC's are installed. | T.EL.PJK.040 |
|----|---|--------------|

Agree. Will revise 1.4.1.

| | | |
|----|---|--------------|
| 42 | FS-SP-1614 3.2.1 Add "...Acceptance in accordance with the applicable ESF-QALAS". | T.EL.PJK.041 |
|----|---|--------------|

Disagree. Refer to Electrical #33.

| | | |
|----|---|--------------|
| 43 | FS-SP-1615 1.4.1 Revise to: "...is in accordance with the ESF-QALAS of the systems in which the PLC's are installed". | T.EL.PJK.042 |
|----|---|--------------|

Agree. Will revise 1.4.1.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 14

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Electrical

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

44 FS-SP-1615 3.2.1
Add "...Acceptance in accordance with
the applicable ESF-QALAS."
T.EL.PJK.043

Disagree. Refer to Electrical #33.

45 FS-SP-1616 1.4.1
The A/E should consider a separate Level
I grounding grid for the I.D.S. system
because failure of the ground could
affect operation of the system. The
QA Level of such grounding systems
would depend upon the ESF-QALAS of the
equipment dependent upon it.
T.EL.PJK.044

Agree. This ground grid for the IDS system
will be the UPS ground system.

46 FS-SP-1616 3.2.1
Add "...Acceptance in accordance with
the applicable ESF-QALAS."
T.EL.PJK.045

Disagree. Refer to Electrical #33.

47 FS-SP-1617 1.4.1
Revise to: "Systems is in accordance
with ESF-QALAS 6.7.1-0002."
T.EL.PJK.046

Agree. Will revise 1.4.1.

48 FS-SP-1617 3.2.1
Add "...Acceptance in accordance with
ESF-QALAS 6.7.1-0002."
T.EL.PJK.0

Disagree. Refer to Electrical #33.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 15

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Electrical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------|--|------------------------------------|
| 49 | FS-SP-1618 | 1.4.1 Revise to: "...Controls, shall be in accordance with the ESF-QALAS of the systems in which they are installed." T.EL.PJK.048 | Agree. Will revise 1.4.1. |
| 50 | FS-SP-1618 | 3.2.1 Add: "...Acceptance in accordance with the applicable ESF-QALAS." T.EL.PJK.049 | Disagree. Refer to Electrical #33. |
| 51 | FS-SP-1619 | 1.4.1 Revise to: "...Heaters shall be in accordance with ESF-QALAS (to be issued)." T.EL.PJK.050 | Agree. Will revise 1.4.1. |
| 52 | FS-SP-1619 | 3.2.1 Revise to "...Acceptance in accordance with ESF-QALAS (to be issued)." T.EL.PJK.051 | Disagree. Refer to Electrical #33. |
| 53 | FS-SP-1619 | 3.2.1 Revise to "...Acceptance in accordance with ESF-QALAS (to be issued)." T.EL.PJK.052 | Disagree. Refer to Electrical #33. |

COMMENT RESOLUTION SHEET

Page 1

ES0101
7/88

Document Originator F&S
Date 8/8/88
Document Title ESF 100% Technical Review
Title I
Mechanical
Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson L. Beale Date 9/15/88
QA John Kanneke Date 9/15/88
AE M. Wilson ^{for} R.L. Bullock Date 9-16-88
WMPO [Signature] Date 9/16/88

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 2

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Mechanical

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

- 1 FS-SP-0504
Add a section to discuss requirements for process control, hold points, documentation, etc. for QA Level I items.
F.ME.JAJ.010
- 2 FS-SP-0504
Add a section to discuss requirements for Post Weld Heat treatment.
F.ME.JAJ.009
- 3 FS-SP-0902
Add a section to discuss requirements for painting procedures.
F.ME.JAJ.015
- 4 FS-SP-0902
Add a section to discuss personnel qualification.
F.ME.JAJ.012
- 5 FS-SP-0902
Add a section to discuss environmental conditions during application, eg. temp, humidity, etc.
F.ME.JAJ.013

Agree. Will be included when this outline specification is developed into a full specification.

Disagree. Post weld heat treatment requirements are included in the weld procedures to be submitted for approval.

Agree. Sections 3.2, 3.3 and 3.4 adequately cover the painting procedures. However, painting procedures will be required if the item being painted is QA Level I.

Agree. If the specified steps in Part IV, "Execution" are followed, the paint will be properly applied. However, personnel qualifications will be required if the item is QA Level I.

Agree. This will be included in Section 3.4 "Application" when this outline specification is developed into a full specification.

COMMENT RESOLUTION CONTINUATION SHEET

JES0102
7-88

Page 3

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-----------------------------|---|---|
| 6 | FS-SP-0902 | Add a section to discuss curing processes and requirements. F.ME.JAJ.014 | Agree. This will be included in Section 3.4 "Application" when this outline specification is developed into a full specification. |
| 7 | FS-SP-0902 | Add a section to discuss requirements for process controls, hold points, documentation, etc., for QA Level I items. F.ME.JAJ.011 | Agree. See Response to Comment 1. |
| 8 | FS-SP-0902 | Add a section to discuss requirements for process controls hold points, documentation, etc. for QA Level I items. F.ME.JAJ.016 | Agree. See Response to Comment 1. |
| 9 | FS-SP-0902 PARA. 1.4.1 | The QA Level assignment for this specification should be the same as the individual specification for each item or system being painted, and not Level III as indicated in Para. 1.4.1. F.ME.JAJ.020 | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 4

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|--|
| 10 | FS-SP-1500 | 1.4 SUBMITTALS, PAGE 1 1.4.1.1 refers to Division 1 requirements. Division 1 specifications were not included in the review documents package. R.ME.LGC.022 | Agree. They will be part of the final specification. |
| 11 | FS-SP-1501 | 1.3.2 PAGE 2 Add the words "and meter" after the word "collect" under SYSTEM DESCRIPTION. G.ME.MSW.015 | Disagree. The metering devices for mine supply water and mine waste water is currently located on the surface near the collar areas, specifically in the utility tunnels of ES-1 and ES-2. This is an H&N function at this time. |
| 12 | FS-SP-1501 | 2.1.1 PAGE 3 Add the words "water meters" under MATERIALS. G.ME.MSW.016 | Disagree. See Response to Comment 11. |
| 13 | FS-SP-1501 | SECTION 1.4.1 Instead of Quality Levels, list the applicable QALAS, i.e. 6.7.1-0013, 6.7.1-0015 and for "Compressed Air System Piping" - "QALAS to be issued". T.ME.PJK.018 | Agree. Will comply with current QA requirements. |
| 14 | FS-SP-1507 | SPECIFICATION The valves used for the ESF water and compressed air systems will be basic | Disagree. The line break valves will not be off-the-shelf. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 5

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|--|
| | | <p>off-the-shelf items. This specification should be revised to cover procurement, inspection, installation and testing of the valves, but not manufacture of the valves.</p> <p style="text-align: right;">T.ME.RLT.012</p> | <p>Procurement should not be part of this specification section.</p> <p>Section 3.2 does cover installation and will be expanded in the full Title II specification.</p> <p>Section 3.3 does cover inspection and testing.</p> <p>Valve fabrication practices (manufacturer) should be included in Part 2 - Products.</p> <p>Agree. Will comply with current QA recommendations.</p> |
| 15 | FS-SP-1507 | <p>SECTION 1.4.1 Instead of Quality Levels, list the applicable QALAS, i.e. 6.7.1-0013, 6.7.1-0015 and for "Compressed Air System Valves", QALAS to be issued".</p> <p>Part 3 - Sections 3.1, 3.2, 3.3, and 3.4 shall be in accordance with the Quality Level of the applicable QALAS.</p> <p style="text-align: right;">T.ME.PJK.019</p> | |
| 16 | FS-SP-1507 | <p>The quality level of valves, meters, and fittings that could affect fluid control should be quality level 1. See QALA 1.2.6-0001. It appears to me</p> | <p>Need further clarification of fluid control. Mine waste water and mine supply water systems are two different QA levels, and fluid control is yet different again. What defines the parts of water systems that fall</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 6

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|---------------------------------|--|--|
| | | that failure of this component could cause uncontrolled spillage of water in the ESF. A.ME.TJM.005 | under fluid control? If the entire system falls under fluid control, why do we specify different QA levels for each? |
| 17 | FS-SP-1509 PART 2 - PRODUCTS | SPECIFICATION -2.2 Change to "pressure indicator" -2.3 Change to "temperature indicator" -Add to list: -Flow controller -Pressure controller T.ME.RLT.013 | Agree. |
| 18 | FS-SP-1509 | SECTION 1.4.1 Instead of Quality Levels, list applicable QALAS, i.e. 6.7.1-0013, 6.7.1-0015 and for compressed air system, "QALAS to be issued". Part 3, Sections 3.1, 3.2, and 3.3 shall be in accordance with the Quality Level of the applicable QALAS. T.ME.PJK.0 | Agree. Will comply with current QA recommendations. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 7

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--|---|--|
| 19 | FS-SP-1510 | SECTION 1.4.1 Change to: "The Quality Assurance Level Assignment for the Mine Water Supply Distributin System is in accordance with ESF QALAS 6.7.1-0013". Reason - QA Level may change. T.ME.PJK.017 | Agree. Will comply with current QA recommendations. |
| 20 | FS-SP-1510 Section 1.4 QA | Make compatible with QALA 1.2.6-0001 Fluid Control, which is QA Level I. R.ME.MAF.017 | QALA 1.2.6-0001 "Fluid Control" will be applied where required. |
| 21 | FS-SP-1510 | SECTION 1.4.1 T.ME.PJK.016 | No comment. |
| 22 | FS-SP-1511 2.1 PAGE 1 Add "water meters" as 2.1.9 under MATERIALS. G.ME.MSW.017 | | Disagree. See Response to Comment 11. |
| 23 | FS-SP-1511 | SECTION 1.4.1 Instead of Quality Level II, refer to ESF QALAS 6.7.1-0015. Part 3 - Sections 3.1, 3.2, and 3.3 shall be in accordance with the | Agree. Will comply with current QA recommendations. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 8

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|---|
| | | requirements of QALAS 6.7.1-0015. T.ME.PJK.014 | |
| 24 | FS-SP-1512 | SECTION 1.4.1 Instead of Quality Level II, refer to "QALAS to be issued". Part 3 - Complete in accordance with the "QALAS to be issued". T.ME.PJK.015 | Agree. Will comply with current QA recommendations. |
| 25 | FS-SP-1513 | 2.1 PAGE 1 Add "calibration requirements" under MATERIAL AND FABRICATION. G.ME.MSW.018 | Disagree. "Factory Testing and Inspection" (Section 2.1) documents pump performance characteristics. "Calibration Requirements" would apply to the metering devices used in the testing process. |
| 26 | FS-SP-1513 | SECTION 1.4.1 Instead of Quality Level, refer to "ESF QALAS to be issued". Part 3, Section 3.1 and 3.2 refer to requirements of "ESF QALAS to be issued". T.ME.PJK.020 | Agree. Will comply with current QA recommendations. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 9

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|----------------------------------|---|---|
| 27 | FS-SP-1514 2.1 PAGE 1 | Add "calibration requirements" under MATERIALS AND FABRICATION. G.ME.MSW.019 | Disagree. See Response to Comment 25. |
| 28 | FS-SP-1514 1515, 1516 SECT.1.4.1 | Instead of Quality Level, refer to "ESF QALAS to be issued". Part 3, Section 3.1 and 3.2 refer to requirements of "ESF QALAS to be issued". T.ME.PJK.021 | Agree. Will comply with current QA recommendations. |
| 29 | FS-SP-1515 2.2 PAGE 1 | Add "calibration requirements" under MATERIALS AND FABRICATION. G.ME.MSW.020 | Disagree. See response to comment No. 25. |
| 30 | FS-SP-1517 | Section 1.4.1 Instead of Quality Level, refer to "ESF-QALAS to be issued". Part 3, Section 3.1.3.2 - Complete in accordance with "ESF-QALAS to be issued". T.ME.PJK.027 | Agree. Will comply with current QA recommendations. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 10

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Mechanical

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------|--|--|
| 31 | FS-SP-1518 | <p>Section 1.4.1 Instead of Quality Level, refer to "ESF-QALAS to be issued".</p> <p>Part 3 - Complete in accordance with "ESF-QALAS to be issued".</p> <p>T.ME.PJK.028</p> | <p>Agree. Will comply with current QA recommendations.</p> |
| 32 | FS-SP-1519 | <p>Section 1.4.1 Instead of Quality Levels, refer to ESF-QALAS 6.7.1-0013 and 6.7.1-0015.</p> <p>Part 3 - Complete in accordance with requirements of ESF-QALAS 6.7.1-0013 and 6.7.1-0015.</p> <p>T.ME.PJK.029</p> | <p>Agree. Will comply with current QA requirements.</p> |

COMMENT RESOLUTION SHEET

Page 1

ES0101
7/08

Document Originator F&S
Date 8/8/88
Document Title ESF 100% Technical Review
Title I
Mining
Coordinator _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Chairperson L. Beaulieu Date 9/15/88
QA John Kennock Date 9/15/88
AE M. Wilson for R.L. Bullock Date 9-16-88
WMPO [Signature] Date 9/16/88

COMMENT NO. PAGE REVIEWER'S COMMENTS

RESOLUTION

See Page 2 for start of comments.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 2

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Mining

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

- 1 FS-GA-0150
Add the word "operation" to the title since this drawing shows the shaft fully equipped. A similar drawing should be added to the package showing the layout of the UDBR during preparation of the excavation effects test. Since this is a major test which will be conducted prior to installation of permanent shaft furnishings, some additional planning may be necessary to ensure that any special requirements for the testing can be satisfied by the shaft sinking contractor.

T.MI.ALL.001

- 2 FS-GA-0150
Identify the cutout for the future loading pocket shown in Section A-A.

R.MI.RRR.011

- 3 FS-GA-0150
On Section B-B, the location of the cutout for the future loading pocket is shown incorrectly.

R.MI.RRR.012

Disagree. The word "operation" would not add to the understanding of the title. Dwg. FS-GA-0151 depicts the excavation effects test. Will put excavation effects test on a separate drawing for Title II showing additional views during the various construction phases.

Same as Shaft Comment 104.

Same as Shaft Comment 104.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 3

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

4 FS-GA-0150 A4
The space similar to the future loading chute space should not show in Section B-B. Delete.
G.MI.TLL.018

5 FS-GA-0150
There is no obvious justification for the width of the shaft station and east drift to be 25 ft. wide. Reduce size to 22 ft. or state why larger size is required.
J.MI.LJO.013

6 FS-GA-0150
Vent duct arrangement shown does not allow for series ventilation with MTL.
J.MI.LJO.039

7 FS-GA-0151 AND FS-GA-0164
The number of boreholes to be drilled as part of the Excavation Effects Test at each of the UDBR and MTL stations are shown in the drawings as: 6 permeability holes, 6 stress relief holes, and 6 extensometer holes (total of 18 holes). However, the SDRD (also the SCP and ESTP) requires 9 of each type of hole for a total of 27 holes.

Agree.

This is in resolution of 50% Mining Comment #16. 25 ft. wide station provides access for men and materials around the shaft. It provides greater flexibility and ease for future expansion, eliminates smooth wall transition rounds, and does not appreciably add to cost.

Disagree. Drawing will be correctly labeled to indicate presence of a damper (normally closed) between the level vent pipe and the exhaust duct.

Agree.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 4

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|---|
| | | Inconsistency needs to be resolved. T.MI.DMR.009 | |
| 8 | FS-GA-0151 | UDBR PLAN UDBR Plan dimensions do not agree with those on Dwg. R07048A/6 in Appendix A of the SDRD, specifically the area centered on the shaft and the area to the NE. T.MI.EMC.021 | Agree. Will be updated by 30% Title II. |
| 9 | FS-GA-0151 | ZONE D5 Plan of UDBR is inconsistent with drawing to its left (and ECR-007) regarding length of extension east of the station (70' vs. 85') and the central location of shaft. T.MI.DMR.010 | Agree. Will increase to 85'. |
| 10 | FS-GA-0151 | ZONES A6, B6 For the Plate Loading Test, the scale of Detail 1 and Section A-A on full-size drawing should be 1/10" = 1'-0". Scale bar also needs to be changed. In the legend add a circle to MPBX symbol to make it consistent with Plan View above and FS-GA-0003. T.MI.DMR.011 | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 5

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------|--|---|
| 11 | FS-GA-0160 | Indicate first 50 ft. of drifts to tuff main and imbricate fault as an excavated portion of the MTL to be used as support areas for test bed construction. R.MI.WHG.017 | Agree. Will indicate these areas may be used for support during MTL development. |
| 12 | FS-GA-0160 | To avoid becoming muck bound at the face when using the shaft for hoisting men and materials, a muck stockpile area is required in service drift no. 1 on the NE side and in line with the ES-2 shaft access drift. Functional requirement 1 of Section 1.2.6.6 of the SDRD requires that the facility be designed to support the construction effort. (50% R.I.WG.022). R.MI.WHG.034 | Core area can be used for stock piling until testing begins. The widened areas in the long exploratory drifts are also stockpile areas. |
| 13 | FS-GA-0160 | Operational considerations require operational areas for a craft lunchroom plus storage for tools and supplies which cannot safely be stored in the drifts. SDRD.1.2.6.6 functional requirement 1 requires space to be made available for operations. | Agree. ECRs will be submitted to cover these considerations by 30% of Title II. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 6

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|--|--|
| | | Requirements for operational space underground are for craft labor agreements and housekeeping needs. (50% R.I.WG.028) R.MI.WHG.036 | |
| 14 | | FS-GA-0160 DAS locations are not shown. (50% R.I.WG.027) R.MI.WHG.035 | DAS needs have not been transmitted as design input. |
| 15 | | FS-GA-0160 Show detail of how entry intersections are constructed to comply with +6 -0 excavation tolerance. R.MI.WHG.018 | F&S will attempt to show this detail at 30% of Title II. |
| 16 | | FS-GA-0160 Redraw the coordinate intersection marks so they are aligned with the coordinate system. (See 50%, Mining Comment 35). T.MI.EMC.003 | Agree. |
| 17 | | FS-GA-0160 Delete the refuge chamber note located in zone C-4. R.MI.RRR.013 | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 7

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|---|
| 18 | FS-GA-0160 | Suggest that all drifts and alcoves be named or identified uniquely to establish a standard nomenclature. T.MI.IRC.009 | Agree. |
| 19 | FS-GA-0160 | An ECR will need to be submitted by Los Alamos to modify drift geometry for the Engineered Barrier Test. Specifically, the separation between the vertical waste package drifts needs to be 76 ft. and the drift width in the first 50 ft. of the horizontal and vertical drifts will need to be 20 ft. wide to allow drilling and instrumentation operations in the rib. A.MI.TJM.002 | Defer to LANL. |
| 20 | FS-GA-0160 | Flexibility is greatly constrained by having the sequential mining test located as shown. This drift is the main access through the ESF and the location of the core area facilities indicates the need for additional isolation. A barrier pillar south of panel access drift number 2 should be considered. Further, a barrier pillar | Disagree. Current MTL satisfies requirements as given. Will meet early in Title II among A/E and program participants to re-address these concerns and to gather updated information. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 8

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Mining

| COMMENT NO. | PAGE REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--|--|
| | <p>should also be considered west of service drift number 4 to enhance flexibility in locating tests in that area and to provide a more definite arrangement for utility corridors. K.MI.JEM.006</p> <p>21 FS-GA-0160 (FLEXIBILITY) Current arrangement of MTL is fine provided experiments remain as they are currently planned; however, if experiments change in configuration or orientation, current design will not accomodate these changes without a major impact. An alternative design that can more readily accomodate changes in experiment type, configuration, location and orientation is required. An example of such an alternative is:</p> <p>Increase dimension between service drifts 1 and 4 and panel drifts 1 and 2 so that DBR, sequential drift mining and vertical waste package experiments can be situated between panel access drifts 1 and 2. This would allow the outer perimeter of the area encompassed by service drifts 1 and 4</p> | <p>Disagree. Flexibility is provided to the extend that potential experiment change is known. Additional excavation can be carried out to the south. In order to determine that the present layout is, in fact, unsuitable and to determine what alternates would better fulfill current requirements, the latest available needs of the P.I. for testing, including configurations, offsets, orientation possibilities, and flexibility requirements should be formally transmitted to the A/E as revised design input as soon as possible. F&S Suggests a meeting(s) wherein clarification of these needs can be formalized prior to issuance, of an ECR or additional design input prior to commencing Title II work.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 9

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------|--|---|
| | | <p>and panel access drifts 1 and 2 to be available for locating all other experiments and alcoves for organizational computers and IDS's. This arrangement would allow greater flexibility in relocating experiments if required. Additionally, this would provide improvements for ventilation, traffic and utility routing.</p> <p>This comment is based on required for flexibility implicate in 10 CFR 60 subpart F and 10 CFR 60 133.(b). Additionally, need for flexibility is evidenced in approach to review and approval of study plans.</p> <p style="text-align: right;">S.MI.RES.004</p> | |
| 22 | FS-GA-0160 | <p>MECHANICAL</p> <p>Meets requirements of SDRD but will require significant modifications in future to reflect ECR submitted but not approved. Changes will include drift sizing, spacing, and computer and IDS alcoves. Does not adequately provide for equipment installation in boreholes -- insufficient drift width. (See L.I.DW.004-50% Review comment.)</p> <p style="text-align: right;">L.MI.DGW.009</p> | <p>See Mining Comments #19 and #21. The Requirements should be conveyed to the AE for evaluation.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 10

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-------------------------|---|--|
| 23 | FS-GA-0160 ZONE B3 | <p>The pillar width between the eastern Waste Package Vertical drift (16 ft. wide) and the repository drift (approximately 21 ft. wide) is shown as 22 ft. This represents a pillar width between the drifts of approximately one drift diameter.</p> <p>From the point of view of stress interaction between openings and good mining practice, this is the minimum acceptable spacing under normal operating conditions. Due to the fact that this pillar eventually will be subject to thermal stresses from repository waste, and that we may later have to show that the ESF design does not impact the integrity of the repository, it is recommended that the width of this pillar be increased to 2 times the width of the larger drift (i.e., 42 ft.)</p> <p style="text-align: right;">T.MI.DMR.014</p> | <p>Agree, will investigate the applicability of concerns of Title II design.</p> |
| 24 | FS-GA-0160 B6 | <p>Identify Bulk Permeability Test area.</p> <p style="text-align: right;">G.MI.RWC.011</p> | <p>Disagree. Location has not been given to the AE.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 11

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|---|
| 25 | FS-GA-0160 | <p>The size of the refuge chamber appears to be too small for the planned number of people underground. Also ensure interfaces with Appendix A and performance assessment activities.</p> <p>J.MI.LJO.043</p> | <p>Title II design will consider most recent population studies for Refuge Chamber sizing. An ECR will be generated to cover Appendix A interface.</p> |
| 26 | FS-GA-0160 | <p>UPS drift in area B5 appears unnecessary. Add this facility in power center drift to maintain shaft pillar.</p> <p>J.MI.LJO.016</p> | <p>Disagree. Locating the UPS in the same drift as the power center compromises safety and integrity of the UPS in the credible accident scenario of a fire in the power center.</p> |
| 27 | FS-GA-0160 | <p>The sump drift in area B6 does not appear to be necessary, state why a sump drift is needed and ensure interface with SDRD Appendix A is maintained.</p> <p>J.MI.LJO.041</p> | <p>Due to particle settling requirements, the sump requires more space than a standard drift width allows. Refer to F&S Design Analysis FS-CA-0044 for further explanation. An ECR will be generated to cover Appendix A interface.</p> |
| 28 | FS-GA-0160 | <p>Fuel station in Area C5 appears too close to DBR, relocate to not interfere.</p> <p>J.MI.LJO.042</p> | <p>Disagree. Discussions with LANL indicate that this is not a problem with DBR tests, however, alternate locations and layout will be examined in Title II to accommodate fuel bay and operational spaces.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 12

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|---|
| 29 | FS-GA-0160 | <p>JS-025-ESF-FP3.B Reference CFR 30 Section 57.4462 Storage areas for combustible liquids must be provided with a means of confinement or removal of contents of largest storage tank in the event of tank rupture. Neither drawing provides this information or the area fire protection characteristics. M.MI.RMB.002</p> | <p>Agree. Detail liquid containment facilities design, as well as fire protection facilities design will be provided in Title II.</p> |
| 30 | FS-GA-0160 | <p>JS-025-ESF-FP3.B Reference 30 CFR Section 57.4460 Only small quantities of flammable liquids can be stored underground. Fueling area does not identify product or storage method. M.MI.RMB.005</p> | <p>Agree. Will attempt to address these problems by 30% Title II. An ECR will be submitted.</p> |
| 31 | FS-GA-0160 | <p>ZONE H10, JS-025-ESF-FP3.B ZONE D-5 Drawings conflict on location of fuel storage area. H&N drawing depicts preferable location because area can be sealed and is not exposed to traffic. M.MI.RMB.001</p> | <p>Disagree. Location shown provides drive-through access with two means of egress in a lower volume traffic drift. Life Safety committee considers a dead-end cutout as less desirable. Alternate location for fuel transfer area will be considered in the same ECR effort to provide additional operational space. See Mining Comment #13.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 13

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--------------------|--|--|
| 32 | FS-GA-0161 | Canister scale heater test encompasses area along the eastern rib of panel access drift No. 1 between the test alcove and service drift No. 4. Redraw as required. R.MI.WHG.019 | Agree. |
| 33 | FS-GA-0161 | Show drift to Ghost Dance Fault relative to general layout (G.I.BG.013). G.MI.RWC.004 | Disagree. Not enough room. Exploratory drifts are shown on the other drawings. |
| 34 | FS-GA-0161 B7 | Identify Bulk Permeability Test area. G.MI.RWC.012 | Disagree. See Mining Comment #29. |
| 35 | FS-GA-0162 | No comment. R.MI.DRD.009 | No response. |
| 36 | FS-GA-0162 | Show distance between rows of bolts. R.MI.WHG.020 | Agree. Title II drawings will show prescribed bolt pattern spacing. |
| 37 | FS-GA-0162 | Show the typical details for a permanent grouted rock bolt. Include bolt length, diameter, plate, washer, nut, grout, | Agree. Title II effort. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 14

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-------------------------|--|------------|
| | | hole size, etc. R.MI.RRR.014 | |
| 38 | FS-GA-0162 4B | Wire mesh installation is not standard mining practice. This installation does not permit retensioning of rock bolt. Place mesh directly against rock. T.MI.SCS.062 | Agree. |
| 39 | FS-GA-0162 ZONE A4 | It probably will be necessary to retorque some or all of the mechanical bolts, and to test some of them to evaluate how effective they are. The double plate, double nut arrangement (shown in Detail 1) appears to preclude this (or make it very time consuming) since the top plate must be removed prior to retorquing. Suggest that a single plate be used, clamping the mesh directly to the rock face. This may not look as nice, but will be more efficient in providing effective support to the excavated opening. T.MI.DMR.015 | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 15

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|-------------------------|---|--------------------------------|
| 40 | FS-GA-0163 | Provide ground support and control blasting details of infiltration test, especially in the block of rock being tested. R.MI.WHG.021 | Agree. Title II. |
| 41 | FS-GA-0163 ZONE C5 | Section B-B of the Infiltration Test is not consistent with Section A-A (e.g., heights of cross-cut and Service Drift No. 4; also the latter drift should be shown as a broken line). T.MI.DMR.007 | Agree. |
| 42 | FS-GA-0163 | Section B-B view is in error. T.MI.SCS.063 | Agree. Will correct this view. |
| 43 | FS-GA-0163 A5, A7 | (50 Percent G.I.TL.015, 016) Change descriptions of TYPICAL ES-1 STATION AREA and TYPICAL ES-1 SHAFT ELEVATION from "... SHOWING EXCAVATION EFFECTS TEST..." to "... SHOWING INTACT FRACTURE TEST..." G.MI.TLL.004 | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 16

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------------------------|---|---|
| 44 | FS-GA-0163 A5 | Change "Excavation Effects Test Coring" to read "Intact Fracture Test Coring" (G.I.BG.014). G.MI.RWC.005 | Agree. |
| 45 | FS-GA-0163 A7 | Change "Excavation Effects Test" to read "Intact Fracture Test" (G.I.BG.015). G.MI.RWC.006 | Agree. |
| 46 | FS-GA-0163 GRID A-5, A-7 | Change "Excavation Effects Test" to "Intact Fracture Test". G.I.MW.019 G.MI.MSW.003 | See Comment #45. |
| 47 | FS-GA-0163 ZONES A7 AND A5 | Wording below the two left-hand diagrams of the Intact Fracture Test should refer to the "intact fracture test" instead of the "excavation effects test." T.MI.DMR.006 | See Comment #45. |
| 48 | FS-GA-0164 | Note 1 states, "All holes drilled dry", Note 4 states, "Dust collection system." As a dust collection system is to be used in lieu of wet drilling, | Disagree. The configuration of this test is proposed to be significantly changed. Title I design of utilities has provided adequate ventilation and other services to allow dry drilling where required. F&S agrees |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 17

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--------------------------|--|---|
| | | <p>the bounding features of this system need to be identified, to provide assurance that the 100 percent title I design is adequate to accommodate this system (ventilation, power requirements, etc.). Additionally, California Administrative Code, Mine Safety Orders, Article 31 7093(b) states, "Rock drilling in underground mines is prohibited unless the dust is controlled by wet drilling or other means acceptable to the Division." Therefore, the dust collection system needs to be approved as acceptable by the body enforcing these regulations, or by DOE ES&H.</p> <p style="text-align: right;">K.MI.DW.016</p> | <p>comply with all regulations. The A/E assumes that DOE ES&H currently accepts regulation conformance of this design by virtue of their design review participation.</p> |
| 49 | FS-GA-0164 GRID D-2 | <p>The agreed resolution of a 50 Percent Design Review comment was that the A/E would evaluate feasible dust control measures for dry drilling. Progress has been made, including identification of portable air filtration systems. Written documentation of this evaluation should be provided before completion of Title I, including indication of the locations and</p> | <p>Preliminary dust control was addressed and documented in an F&S design report; additional site data is required before more detailed work can be accomplished.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 18

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------|--|---|
| | | <p>operations where this equipment can be effectively used, and identification of dry drilling or mining operations for which additional dust control measures will be needed. (The relevant comment was identified as T.I. SP.011 and listed as I-062 in the 50 Percent Design Review Report).</p> <p style="text-align: right;">T.MI.SWP.015</p> | |
| 50 | FS-GA-0164 | <p>B7 Permeability or stress testing holes next to muck bin cutout may be impacted by overbreak from excavation of the bin area. Special excavation controls for this area will be needed.</p> <p style="text-align: right;">K.MI.JEM.011</p> | <p>Agree. Controlled drilling and blasting practices are planned.</p> |
| 51 | FS-GA-0164 | <p>ZONE D6 Arrangement of the boreholes B, B, and A in the Bulk Permeability Test differ from that shown in the SDRD. Also, holes are labelled as being 100' in length but shown as being about 160' in length.</p> <p style="text-align: right;">T.MI.DMR.008</p> | <p>Agree.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 19

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|-------------------------|--|---|
| 52 | FS-GA-0165 B6 | To the title of "Layout, Plate Loading Test" add "in Demonstration Breakout" to better tie this to FS-GA-0161. As an alternative, add "Plate Loading Test" to the demonstration breakout boxed area on FS-GA-0161. T.MI.EMC.022 | Agree. |
| 53 | FS-GA-0165 C7 | Delete reference to UDBR under plan view because this test in the UDBR is covered on FS-GA-0151. T.MI.EMC.023 | Agree. |
| 54 | FS-GA-0165 ZONE A4 | Symbols for geotechnical instrumentation should be modified to be consistent with FS-GA-0003 (e.g., neutron probe, thermocouple). T.MI.DMR.016 | Agree. |
| 55 | FS-GA-0166 | The shape of the drill chambers at the end of the three vertical waste package test drifts would be extremely difficult to smooth blast with a normal jumbo. Transitions must be much longer. Show longer transitions. | Appropriate test drift and drill chamber section transition details will be provided during Title II. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 20

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------|---|--|
| 56 | FS-GA-0166 | <p>R.MI.WHG.022</p> <p>Rib on widened section of center (decline) drift cannot be control blasted as shown per Performance Criteria 3, 11, and 23 of Section 1.2.6.6 of the SDRD. Re-design as required. (50% R.I.WG.039)</p> <p>R.MI.WHG.037</p> | <p>Agree. Drift enlarging details will be furnished in Title II drawings entitled "Controlled Blasting Plans and Details".</p> |
| 57 | FS-GA-0166 | <p>Roof on 25 ft. high raised area cannot be control blasted as designed per Performance Criteria 3, 11, and 23 of Section 1.2.6.6 of the SDRD. Re-design as required. (50% R.I.WG.040)</p> <p>R.MI.WHG.038</p> | <p>Agree. Drift enlarging details will be furnished in Title II drawings entitled "Controlled Blasting Plans and Details."</p> |
| 58 | FS-GA-0166 | <p>Sections A-A and B-B are not drawn to same scale as noted.</p> <p>T.MI.SCS.064</p> | <p>Agree. Will correct drawings.</p> |
| 59 | FS-GA-0166 | <p>A4, B4, C3</p> <p>Section E-E is drawn upside down relative to the orientation of the section markers on Section C-C (See 50% Mining Comment 71). In conjunction with</p> | <p>Agree. Will correct drawings.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 21

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|---|
| | | <p>this, Section D-D should be drawn with the collar on the right side to be compatible with the orientation of the section markers on C-C. If it is the intent to show both sections D-D and E-E with the collar on the left, then the arrows on the Section D-D markers on Section C-C must be reversed.</p> <p style="text-align: right;">T.MI.EMC.004</p> | |
| 60 | | <p>FS-GA-0166 ZONE C3 In Section C-C of the Canister Scale Heater Test, Section lines E-E and D-D should be rotated slightly, to more accurately reflect the instrument holes intersected and shown in the sections below. Also symbols for geotechnical instrumentation should be modified to be consistent with FS-GA-0003 (e.g., MPBX, neutron probe).</p> <p style="text-align: right;">T.MI.DMR.003</p> | Agree. |
| 61 | | <p>FS-GA-0166 PLAN Meets requirements of SDRD but will require significant modifications in future to reflect ECR submitted but not approved. Changes will include drift sizing, spacing, and computer and IDS alcoves. Does not adequately provide</p> | See Mining comments #19 and 21. The requirements should be conveyed to the AE for evaluation. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 22

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Mining

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

for equipment installation in boreholes
-- insufficient drift width. (See
L.I.DW.004-50% Review comment.)

L.MI.DGW.010

62 FS-GA-0166 REV B GRID 7-A
Heater emplacement hole is 40 feet deep.
A 20 foot long heater will be emplaced
in the hole.

A.MI.SDF.013

63 FS-GA-0166 SECTION B-B
Height shown at ends of vertical test
drifts does not reflect increased
section (see Section AA). Heater holes
scale at slightly less than 30 ft. and
drift separation also scales at this
amount. Heater holes are 40' deep and
drift separation is 37 ft. (SDRD).

L.MI.DGW.008

64 FS-GA-0166 SECTIONS A-A & B-B

Section A-A. The 190 ft. dimension for

Criteria comment.

Agree. Will make corrections.

Agree. Corrections will be made.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 23

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|---|------------|
| | | <p>the sloped drifts does not agree with the 150 ft. dimension given on Dwg. R07048A/4 in Appendix A of the SDRD. The 280 ft. dimension just below it is also in disagreement. The 190 ft. dimension scales 150 ft. If 150 ft. is the intended dimension, remove the break lines. If the intended dimension is 190 ft., the elevation difference at the right side is not compatible with the slopes stated and there needs to be elevation offsets at the break lines.</p> <p>Section B-B. The portions of cross sections of the drifts labeled, "Waste Package Vertical", that are shown near service drift No. 4 should be shown dashed, not solid. Only the portions of the drifts actually at Section B-B on the plan view should be shown solid. The 12" heater emplacement holes should be shown starting at the 3099.95 floor level of the "Waste Package Vertical" drifts.</p> | |

T.MI.EMC.024

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 24

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------------------------|---|--|
| 65 | FS-GA-0166 | SECTION B-B LLNL has not agreed to dry drilling nor have we specified such. Dry drilling may jeopardize tests. Appendix C of SDRD specifies wet drilling. L.MI.DGW.017 | Agree. Will remove note 2. |
| 66 | FS-GA-0171 7B | Provide large door in science shop wall/stopping to allow equipment movement if other door is temporarily blocked. T.MI.SCS.066 | Disagree. It is anticipated that the IDS alcove will be almost completely blocked, therefore equipment movement is impossible in this area. |
| 67 | FS-GA-0171 7D | Provide overhead door in shop wall/stopping to allow equipment movement if other door is temporarily blocked. T.MI.SCS.065 | Disagree. There is a door shown. |
| 68 | FS-GA-0171 SCIENCE SHOP | Show a reinforced concrete wall to protect IDS from blast damage when excavating Sequential Drift Mining Test No. 2. R.MI.WHG.023 | Reconfiguration of the layout will be reinvestigated and a solution proposed by 30% of Title II. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 25

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|---|
| 69 | FS-GA-0172 | <p>.B GRID C-7 Spacing of two rows of electrical switch gear five feet apart does not comply with the requirements in 29 CFR 1910.303 (h) and the National Electric Code for minimum clear working space. Widen the drift or modify cabinets to obtain spacing listed in 29 CFR 1910.303 (h) Table S-2, "Minimum Depth of Clear Working Space in Front of Electric Equipment".</p> <p>T.MI.SWP.018</p> | See Electrical Comment #15. |
| 70 | FS-GA-0180 | <p>Section A-A and C-C of this drawing show a 2' x 6' door on the side of the air control door. This doorway is undersized and does not comply with the NFPA 101 Life Safety Code. It is recommended that the door be modified to a minimum of 32" x 80".</p> <p>R.MI.FAS.020</p> | Agree. Title II details will determine the applicability of this code for ESF design. |
| 71 | FS-GA-0180 | <p>B, C, D - 3 AND 4 The design should show, in more detail, how a shotcrete wall is constructed. The rationale should also be available for choosing a shotcrete construction instead of a concrete block wall.</p> | Agree. Title II effort. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 26

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Mining

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

K.MI.DW.014

72 FS-GA-0180 D5
Move Section D-D markers inside the plan
view. (See 50% Mining Comment 91).
T.MI.EMC.005

Agree.

73 FS-GA-0194
Details of transitions and how control
blasting is to be accomplished on the
widened sections of the exploratory
drifts is missing. Add this detail.
R.MI.WHG.024

Title II effort.

74 FS-GA-0194
For ease of identification, label the
ends of the exploratory drifts as
"Ghost Dance Fault", "Drill Hole Wash"
and "Imbricate Fault".
T.MI.EMC.026

Agree.

75 FS-GA-0194 A5, A6
Show the match line between sheets 0197
and 0198.
T.MI.EMC.025

Agree.

76 FS-GA-0199 B-4
Turning point along drifts should be
designed with a curve radius

Disagree. Not required for the minor
direction change indicated. Curve would
complicate controlled blasting.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 27

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|---|
| | | <p>appropriate to the type of traffic which could be used in these repository operations.</p> <p style="text-align: right;">K.MI.JEM.009</p> | |
| 77 | | <p>FS-SP-0204</p> <p>Current design of the MTL does not allow this specification to be followed at entry intersections and where the entries change sizes. Change the specification to detail how these areas are to be excavated.</p> <p style="text-align: right;">R.MI.WHG.028</p> | <p>Agree. Drift intersections and size change details with respect to controlled blasting will be covered in Title II.</p> |
| 78 | | <p>FS-SP-0204 PARA. 1.4.1</p> <p>This specification covers both QA Level II and III activities per QALAS 1.2.6-0005 (controlled blasting) and 1.2.6-0002 (mucking) respectively. For the Level II activities, Para. 1.4 should be changed to include the applicable quality assurance program requirements as contained in Para. 1.5 of FS-SP-0205.</p> <p style="text-align: right;">F.MI.JAJ.019</p> | <p>Agree.</p> |
| 79 | | <p>FS-SP-0204 PAGE 2</p> <p>Section 1.4 of the outline should be expanded to list the specific activities that quality assurance will</p> | <p>Agree. Dust control methods will be defined in the Part 3 - Execution subsection. Appropriate dust control will be provided to ensure that airborne dust concentrations will</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 28

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|--------------------------------|--|--|
| | | deal with. This should include dust control procedures associated with all stages of the excavation. B.MI.BC.008 | not exceed regulatory TLV's. |
| 80 | FS-SP-0204 PAGE 2, SECT. 3.1.2 | The concept of local dust control using mobile collectors is not applicable to dust entrained by muck haulage and utility traffic. In light of the constraints placed on the ventilation system by SDRD 1.2.6.7.4, and additional system should be provided for control of dust on the main traffic routes of the MTL and exploratory drifts. This might be accomplished using part of the ventilation system or by using auxiliary controls such as chemicals dust suppressants. B.MI.BC.005 | Agree. Measures to control dust created by vehicular traffic will be specified in Title II. Refer to response B.MI.BC.004 (F&S Mining Comment #147). |
| 81 | FS-SP-0204 PG.3, PAR. 3.1.3 | Suggest rewording as follows: "For drill and blast excavations the deviation of finished surfaces from the lines, grades, and levels shown on contract drawings shall on an average be within a radial tolerance of +6 inches | Agree. The section will be rewritten to eliminate the term "radial distance". "A" line and "B" line dimensions will be defined and referenced. Language for geologic condition allowance will be inserted. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 29

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Mining

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

-0 inches.

Note: Holding to an absolute of +6 inches will be difficult or impossible in this medium.

S.MI.RES.002

82 FS-SP-0204 SECTION 3.1.3
Tolerance does not take into account the reality of needed clearance for currently available drill designs and the 6 inch tolerance will be used up just to provide clearance for the drills which leaves zero tolerance for drill accuracy. Change spec to provide clearance, required by drill feed design for look out and clearance of centralizers, drill and hoses.

R.MI.WHG.027

83 FS-SP-0204 SECTION 3.1.3
Control of fracturing will require light loading of rib holes. This may require a more liberal excavation tolerance. For example, if 16 ft. clear width is required maybe lightly loaded holes at 17 ft. would produce the best results. At any rate fracture control is more important than

Agree. Perimeter holes in each round will have to be angled out enough to allow for drill clearance for the next round.

Agree.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 30

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|----------------------------|--|---|
| | | dimensional control. Perhaps we should focus on the blasting process and accept the resulting physical configuration. T.MI.IRC.022 | |
| 84 | FS-SP-0204 3.5 PAGE 6 | Two top paragraphs on the page are duplicates. R.MI.LGC.010 | Agree. Will eliminate duplicate paragraph. |
| 85 | FS-SP-0204 PAGE 6 | Remove one of the two first paragraphs on top of the page as they are identical. T.MI.EMC.034 | Agree. Will eliminate duplicated paragraph. |
| 86 | FS-SP-0204 3.5 SURVEY WORK | General survey requirements (i.e., experience) will be defined by a project administrative procedure. Technical specifications should be limited to specific technical requirements. T.MI.IRC.023 | Agree. |
| 87 | FS-SP-0204 PAGE 5, 3.3.3 | Add "Perched Water Test" after the first sentence. | Agree. Add " o Perched Water Test if water is encountered". |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 31

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|---|
| 88 | FS-SP-0204 | <p>SECTION 3.6.2 (Penalty) Changing geological conditions may make compliance to this spec impossible. Penalty should be in force only when it is determined that conditions are not changing. G.MI.MSW.010 R.MI.WHG.029</p> | Agree. Will change specification. |
| 89 | FS-SP-0204 | <p>SECTION 3.13 Typically the blasting of "Tites" requires very high powder factors, consequently the remaining surface is "burned" and highly fractured. In many cases tites should be left "as is" unless a clear operational problem is apparent. T.MI.IRC.021</p> | Agree. |
| 90 | FS-SP-0205 | <p>1.2 PAGE 1 Should reference FS-SP-0201, ES-1 and ES-2 Collar Installation, since 0201 cross references 0205 repeatedly. R.MI.LGC.011</p> | Agree. Also add SP-0204 Excavations for Stations, Drifts and Alcoves. |
| 91 | FS-SP-0205 | <p>1.3.3 PAGE 1 Delete reference to "ESF Project Q.A.P.P 002 - Quality Assurance Program Plan".</p> | Agree. Deleted reference. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 32

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

It is not a U.S. DOE NNWSI document. Criteria therein should be detailed in the Quality Assurance or other sections of the specification as appropriate.

R.MI.LGC.012

92 FS-SP-0205 1.5 PAGE 2
Same comment as for 1.3.3 above.

R.MI.LGC.013

Agree.

93 FS-SP-0205 SECTION 1.5
It is unnecessary and redundant to reference NNWSI QA Plan. This tech. spec. should implement all of the appropriate requirements contained in the QA Plan. The constructor must rely on the drawing and specifications to define all the technical requirements. It is understood that nontechnical requirements will be defined by management plans and implementing procedures.

T.MI.IRC.015

Agree.

94 FS-SP-0205 1.6 PAGE 3
Delete and substitute the following:

(The Data Requirements List (DRL)

Disagree to deletion of list "a" thru "i". Section 1.6 "Submittals" is a brief description of each submittal item required. The "DRL" is a list of informational

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 33

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-------------------------------|---|---|
| | | <p>following Section 3 of the specification lists required submittals and the intent of each, i.e. for approval or for record, as well as required submittal periods or dates. Reference for each is to the appropriate specification requiring the data." Delete list a thru i since it duplicates the list in the DRL. R.MI.LGC.014</p> | <p>requirements to be transmitted, which can include approved submittal items, or other required data. This DRL list the points in time for transmittal, frequency of transmittal, number of copies, etc. and may reference the appropriate sections for further clarification.</p> |
| 95 | FS-SP-0205 PAGE 5 1.6 | <p>Under Submittals, add the following item that needs to be submitted by the Subcontractor:</p> <p>"Contractor's Daily Water Usage for blast holes". G.MI.MSW.011</p> | <p>Disagree. Water balance will be taken at the shaft collar. Contractor has no way of measuring water usage at the face.</p> |
| 96 | FS-SP-0205 1.8, PAGE 4 | <p>Delete. This information will be covered by the Terms and Conditions "Changes" or "Differing Site Conditions" clauses and the contract "Consideration" or "Payment" clauses. R.MI.LGC.015</p> | <p>Agree.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 34

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Mining

COMMENT
NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

97 FS-SP-0205 2.1.1
 "Watergel" and "emulsion" are
 different products. Therefore, delete
 "other". Delete "TOVEX 100". Its blast
 strength characteristics are not
 uniquely suited to the situation. It is
 overly restrictive to specify a brand
 name. Delete "DuPont". It no longer
 manufactures explosives.

B.MI.RAD.001

Agree. Will delete brand names and "other."

98 FS-SP-0205 2.1.1, PAGE 5
 Change word "similar" to "equal" or
 specify "blast strength
 characteristics" in detail.

R.MI.LGC.016

Agree.

99 FS-SP-0205 2.1.2
 Same comment as for 2.1.1 above.

R.MI.LGC.017

Agree.

100 FS-SP-0205 2.1.2
 "Watergel" and "emulsion" are
 different products. Therefore, delete
 "other". Delete "TOVEX 90". Its blast
 strength characteristics are not
 uniquely suited to the situation. It is
 overly restrictive to specify a brand
 name. Delete "DuPont". It no longer

Agree. Rewrite paragraph.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 35

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
 F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|-----------------------|--|--|
| | | manufactures explosives. B.MI.RAD.002 | |
| 101 | FS-SP-0205 2.2.1 | Delete reference to NONEL and Ensign Bickford and substitute, "an approved non-electric detonating system must be used". It is overly restrictive to specify a brand name. The word "internal" should be "interval". B.MI.RAD.003 | Agree. Delete brand names. |
| 102 | FS-SP-0205 2.2.2 | Substitute, "An approved detonating cord system shall be used". It should not be the practice of the government to recommend a brand name. B.MI.RAD.004 | Agree. Delete brand names. Note that "approved" implies that the Contracting Officer will review and approve blasting materials. |
| 103 | FS-SP-0205 3.1 | In line 3, add the word "parallel" before holes. B.MI.RAD.005 | Agree. Add "parallel." |
| 104 | FS-SP-0205 3.1 | In Para. 2, line 7, delete "due to blasting procedures". There could be a disagreement as to whether the unacceptable shaft, drift or | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 36

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

foundation is due to blasting procedures
or the nature of the rock.
Regardless, the blasting procedures must
be adjusted.

B.MI.RAD.006

105 FS-SP-0205 3.2
The blasting should conform to safety
standards set forth in 30 CFR 57,
Subpart E, "Explosives". This section
should be specifically referenced
here.

B.MI.RAD.007

106 FS-SP-0205 3.4
The seismograph recording or seismogram
should provide both the peak particle
velocity and frequency of the vibration.

B.MI.RAD.008

107 FS-SP-0205 3.5, PAGE 7
Delete "and the Base Bid unit prices for
pay items involving rock excavation."
Consideration Schedule in the RFP will
provide for bidding such unit priced
items.

R.MI.LGC.018

Agree. Will add reference in Sec. 3.2.

Agree.

Agree. Some basis for adjustment for bid
prices should be provided to allow for
changing conditions.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 37

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--------------------------|---|--|
| 108 | FS-SP-0205 3.5.1.A.1 | The term "consistently" must be defined. I suggest it be defined as 80% of the time. To give this section enforcibility, add, "If the contractor fails to consistently break 85% of the drilled depth in both shafts and drifts, the contractor will be required to reduce the depth of the drill holes". B.MI.RAD.009 | Agree. Amend paragraph as follows: "If the Contractor fails to break 85% of the drilled depth in 8 out of 10 blast rounds, the Contractor will be required to reduce the depth of drill holes at any location. |
| 109 | FS-SP-0205 3.5.2, PAGE 8 | If this specification applies to ES-2, it should be referenced also in the first sentence. R.MI.LGC.019 | Agree. This also applies to ES-2 and will be so referenced. |
| 110 | FS-SP-0205 3.5.5 | In line 3, "criteria" should be "criterion". B.MI.RAD.010 | Agree. |
| 111 | FS-SP-0205 SECTION 3.5 | Machine scaling should be considered as a supplement to the controlled blasting. Perhaps ribs holes could be drilled just inside the neat line and final dimensions achieved by scaling. | If Controlled Blasting does not prove to be adequate in preventing unacceptable wall rock damage - scaling machines could be considered for use. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 38

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Mining

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

T.MI.IRC.012

112 FS-SP-0205 3.6
Delete the last sentence in paragraph 1.
It is a repeat of the next-to-last
sentence.

Agree.

B.MI.RAD.011

113 FS-SP-0205 3.6, PAGE 9
Delete last sentence. It duplicates the
preceding sentence.

Agree.

R.MI.LGC.020

114 FS-SP-0205 PAGE 9, SECTION 3.6
Delete the last sentence on the page as
it is a repeat of the one before it.

Agree.

T.MI.EMC.035

115 FS-SP-0205 SECTION 3.7
Drill deviation plus allowed overbreak
equals 12 inches or six inches over
the allowed profile deviation. Change
specifications to allow reasonable
misalignment, and change inspection
such that they are required for only
the profile holes.

Agree. Perimeter holes will angle out in
order to provide drill clearance. In
addition to this desired maximum overbreak,
whether caused by hole deviation,
overcharging, changing ground conditions,
etc., should be targeted at 6".

R.MI.WHG.030

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 39

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

COMMENT NO. **PAGE** **REVIEWER'S COMMENTS**

RESOLUTION

116 FS-SP-0205 PAGE 10, SECT. 3.10
Quality control for drilling and
blasting should include acceptance
criteria for dust and fume control
equipment and procedures.
B.MI.BC.007

Agree. Dust and fumes from Drilling and
Blasting will be effectively controlled by the
use of mobile dust equipment and the direct
exhaust ventilation system. Appropriate dust
control will be provided to minimize
airborne dust below the threshold limit in
accordance with applicable codes and
standards. Acceptance criteria will be
based on these standards and will be
provided during Title II design.

117 FS-SP-0205 SEC.3.10.2.1 PAR. 3
PAR. 3.10.2.1.C

RE: BLAST HOLE TRACES --- Compliance
with requirement, as stated, cannot be
substantiated-- i.e. requirements are
not quantified. Suggest Hale Casts as a
measure of performance be deleted.
Requirement on overbreak should be
sufficient.
S.MI.RES.003

Disagree. Half casts are a common method of
determining the existence of overbreak.

118 FS-SP-0205 3.10.2.1
In C., there should be a period after
underbreak.
B.MI.RAD.012

Agree.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 40

Document Title

ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|---|
| 119 | FS-SP-0205 | 3.10.2.2 In line 5, "data is" should be "data are". B.MI.RAD.013 | Agree. |
| 120 | FS-SP-0205 | 3.11, PAGE 9 Specify if trial blasts are to be in ES-1 or ES-2 or another location with like conditions. If trial blasts are in ES-1 or ES-2 and do not achieve the desired result according to specifications, the entire shaft could be in jeopardy. Specifications should address alternatives. R.MI.LGC.021 | Agree. |
| 121 | FS-SP-0205 | 3.11.1 The drilling and blasting plan should include a dimensioned sketch of the proposed blast round. B.MI.RAD.014 | Agree. Dimensioned drawings of proposed blast patterns will be furnished in Title II. |
| 122 | FS-SP-0205 | DATA REQUIREMENT LIST References for each submittal listed on the DRL should not be to 1.6 "Submittals" but to an appropriate specification paragraph for which it is required. (e.g. "Credentials of Drilling and Blasting Supervisor" | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 41

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------|---|--|
| | | <p>should reference 1.9, etc.) Each submittal required should be described in detail in its referenced specification paragraph.</p> <p>R.MI.LGC.039</p> | |
| 123 | | <p>FS-SP-0205 DATA REQUIREMENTS LIST No specification is included, other than the list in 1.6, which requires submission (Item 6) of Contractor's Daily Blasting Log and the data required thereon.</p> <p>R.MI.LGC.040</p> | <p>Agree. Will add definitions of the Contractor's Daily Blasting Log and the data required.</p> |
| 124 | | <p>FS-SP-0205 DATA REQUIREMENTS LIST Change "Info - Information" to "REC - Record".</p> <p>R.MI.LGC.041</p> | <p>Agree.</p> |
| 125 | | <p>FS-SP-0205 SHEET 15 Add the following to the Data Requirements List:</p> <p>"Contractor's Daily Water Usage for blast holes".</p> <p>G.MI.MSW.012</p> | <p>Refer to Resolution Comment #95.</p> |

COMMENT RESOLUTION CONTINUATION SHEETNES0102
7-88

Page 42

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|---------------------|---|--|
| 126 | FS-SP-0208 | <p>Specifications and tolerances are necessary for bolthole diameters, bolthole lengths, and bolthole locations not just for bolthole alignment.</p> <p>R.MI.DRD.005</p> | <p>Agree. These will be depicted on detailed Contract Drawings showing various classes of Rock Reinforcement.</p> |
| 127 | FS-SP-0208 | <p>Torque or active pressure requirements, specifications, and tolerances, should be included under bolt installation. Pretensioning and retightening of rock bolts should also be placed under this section.</p> <p>R.MI.DRD.008</p> | <p>Agree. Torque, pressure, and tolerances will be amplified by installation details in the final Title II Spec. in the Part 3 - Execution subsection.</p> |
| 128 | FS-SP-0208 1-3 | <p>It is very important that in the near future, specific procedures be established and the equipment selected to install temporary, permanent, primary and secondary ground support systems for the underground facility. These requirements are in 30 CFR 57. No specifications are presented in this document regarding roof and rib control and these may affect significantly the underground facility design.</p> | <p>Agree.</p> |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 43

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
 F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|--|---|--|
| | | <p>Establishing the procedures and selecting the equipment for ground control by the 60% Title II Design Review would allow the necessary time for constructive comments to finalize the ground control plan for the underground facility. This is especially important because of the many different sized underground openings.</p> | |
| | | B.MI.RLM.001 | |
| 129 | FS-SP-0208 PAGE 1, SECTION 1.2.4 | <p>Explain the need for ACI 318 as there is no other apparent reference to reinforced concrete in this specification.</p> | <p>Use of the reinforced concrete is considered for the station area. Further details will be provided on the respective drawings.</p> |
| | | T.MI.EMC.036 | |
| 130 | <p>FS-SP-0208 PAGE 2 An equipment requirement or specification section should be added to the outline both for drilling the bolt holes and for installing the bolts. The minimum and maximum working heights and widths for such equipment should be included to ensure the equipment is designed to install the required length</p> | | <p>Equipment-type selection is a responsibility of the Contractor. Equipment is sized according to the application.</p> |

COMMENT RESOLUTION CONTINUATION SHEETNES0102
7-88

Page 44

Document TitleESF 100% TECHNICAL REVIEW TITLE I
F&S Mining**COMMENT
NO.****PAGE****REVIEWER'S COMMENTS****RESOLUTION**

of both in the various sizes of
openings.

R.MI.DRD.001

131 FS-SP-0208 PAGE 2

A support system design section should be added to the outline either as a main heading or under bolt installation. In Title II, this section should be developed to include the support strategy, the criteria for selecting a particular bolt and when to use a given bolt system underground. Also the criteria for designing the bolt pattern must be included. Specific items that should be addressed are the bolt spacing, bolt length, bolt orientation and torque requirements.

R.MI.DRD.003

132 FS-SP-0208 PAGE 2

Rock bolt installation should be Section 3.1 in the outline. Subordinate to installation are timing, borehole, and rock face preparation and types of rock bolts to be used.

R.MI.DRD.004

Agree. An appropriate reference will be made to a specific document developed for bolt selection purposes by 60% of Title II.

Refer to response to Mining Comment #127.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 45

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
 F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|---|
| 133 | FS-SP-0208 | <p>PAGE 1 Grout should be added to the product list. R.MI.DRD.002</p> | Agree. |
| 134 | FS-SP-0208 | <p>PAGE 3 Cartridges placement tool, placement of resin cartridges and placement of retainer should be subordinated under resin bolt installation or eliminated from this outline. These items may be too much detail for such a general outline. Grout or pumpable grouts must also be considered as an anchorage system. R.MI.DRD.006</p> | <p>Disagree. Hardware deemed necessary for the proper rock re- inforcement installation must be considered as an integral part of the specification. The importance of these subtitles will become clear in the fully developed specification at 90% of Title II.</p> |
| 135 | FS-SP-0208 | <p>PAGE 3 Because two types of bolts are being considered (mechanical, anchored and resin grouted bolts) criteria must be added specifying where each type of support should be used. R.MI.DRD.007</p> | Refer to response to Comment #131. |
| 136 | FS-SP-0213 | <p>PART 1.3 2ND BULLET Add "or orientation" at end of sentence. (This comment will be the same for all drilling specifications).</p> | Agree. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 46

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|---|--|
| | | A.MI.SDF.014 | |
| 137 | FS-SP-0214 | PART 1.3 2ND BULLET A 15 inch 1,000 ft. borehole cannot be accomplished. Water usage shall be kept to a minimum. (This should be added to all drilling specifications). A.MI.SDF.015 | Disagree. Since this is a drill specification, the drill must have this capability and reference to water usage is not applicable to a drill specification. |
| 138 | FS-SP-0303 | & 0304, 0307, 0308 10 CFR 60.15d(1) requires that site characterization activities be conducted in a manner as to limit adverse effects on the long-term performance of the geologic repository. Further, in accordance with 10 CFR 60.17 2(iv) the SCP/CD Section 8.3.4.2.H requires that "... and shaft and borehole seals will be designed and constructed so that the changes in water chemistry resulting from interaction of those materials with the vadose water ... for [sic] water that might contact a waste package will be within the limits established in Issue 1.4. The tests to evaluate the rock-water interactions in the presence of concretes, grouts and other repository materials (Activity 1.10.4.1.2 SCP/CD) | During the ESF phase, water from the shaft will be collected in the shaft sump and pumped to the surface, and this will not come into contact with waste packages. Similarly, concrete placed in the core area for equipment bases, ventilation barriers, etc., will be situated in areas where drainage is to the shaft. Drainage from exploratory drifts can be intercepted and pumped to the shaft area for disposal to surface. Specification will consider construction materials other than standard concrete, if necessary. |

COMMENT RESOLUTION CONTINUATION SHEET

NE90102
7-88

Page 47

Document Title ESF 100% TECHNICAL REVIEW TITLE I
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|-------------|------------|--|--|
| | | <p>will not be completed by the time shaft construction is scheduled to start. Therefore, the design needs to provide for possible impacts. This issue is not addressed in the specifications, and no provisions are provided for alternatives to standard concrete mixes using Portland Cement.</p> <p>L.MI.DGW.018</p> | |
| 139 | FS-SP-0303 | <p>PAGE 5, SECTION 3.8 Specify a minimum frequency of testing.</p> <p>T.MI.EMC.037</p> | Agree. Title II detail. |
| 140 | FS-SP-0304 | <p>PAGE 1, SECTION 1.1 Explain where drilling and grouting of instrument emplacement holes are covered.</p> <p>T.MI.EMC.038</p> | A comprehensive specification covering exploratory and test hole drilling will be submitted in Title II. |
| 141 | FS-SP-1103 | <p>1.3 Include features in shop for controlling and containing fluids and/or chemicals and spills.</p> <p>T.MI.THP.019</p> | Agree. Appropriate measures (curbs) for containment of non-flammable chemicals and other spills will be provided in Title II drawings. |
| 142 | FS-SP-1105 | <p>PAGE 3, PART 3 Include items under execution similar to those in Part 3 of FS-SP-1106 and</p> | Agree. Will include similar execution items in fully developed specification. |

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 48

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Mining

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

1107.

T.MI.EMC.039

143 FS-SP-1107

No QA level has been assigned to the Mine Service Vehicle. Identify the QA level as "TBD". This comment was made in the 50 Percent review.

F.MI.JAJ.017

Agree.

144 FS-SP-1107

PAGE 3, SECTION 2.1

The entry "o Exhaust Muffler and Air Conditioning Equipment" appears twice in Section 2.1. If "air conditioning equipment" indicates a catalytic converter or exhaust scrubbing system, it should be so stated.

B.MI.BC.009

Agree. Changed E-1 entries as follows:

- o Exhaust Muffler
- o Catalytic Converter and Other Exhaust Conditioning Equipment.

145 FS-SP-1109

PAGE 1

The described unit should be effective for local dust control in operations that can be confined to a small volume by curtains or other means used to control air flow past a work site. Dry drilling is one such operation. It will not be totally effective for an operation that cannot be confined or in an entry where the 10,000 CFM filter

Disagree. Proper use of the mobile dust collector will be effective in any location of the ESF activities. Sizes of ESF drifts are planned ranging from 172 to 425 square feet in cross sectional areas. The air quantity of 10,000 cubic feet per minute processed by the dust collector will be able to produce a drift air velocity before the dust sources ranging from 23 to 58 feet per minute. The airflow pattern will be the

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 49

Document Title

ESF 100% TECHNICAL REVIEW TITLE I

F&S Mining

COMMENT
NO.

PAGE

REVIEWER'S COMMENTS

RESOLUTION

flow is a small portion of the total. In the latter case; if the ventilation is removing a large portion of the dust from the work site, use of the mobile collection system may be unnecessary.

B.MI.BC.001

general direction towards the dust sources and into the inlet hood of the collector. As the air stream tapers towards the inlet hood with a cross sectional area of about 5 square feet, the captured air velocity will rapidly increase to about 2,000 feet per minute. Airborne dust within the captured path of the air stream will be effectively collected. During mucking or drilling or bolting or after blast activity, the inlet hood position will have been adjusted to get the best effect of dust control. Airflow turbulence from the main ventilation circuitry will be controlled without sacrificing the air quality requirement of the drift behind the dust sources. The unit proposed is currently used successfully to collect dust from dry continuous miner operations and should work better in the ESF. One of the objectives of controlling dust at the underground sources is to avoid excessive dust going into the main exhaust system which would involve installation of another dust collecting equipment at the surface. The operation portion of this specification will include operational details and parameters for optimum performance of the dust collector in the ESF.

COMMENT RESOLUTION CONTINUATION SHEET

NES0102
7-88

Page 50

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------------------------|---|---|
| 146 | FS-SP-1109 PAGE 1 | <p>CFR 30 part 57.8529 states that auxiliary fan systems shall minimize recirculation.</p> <p>CFR 30 part 32.9 states that air carrying diesel exhaust gases should be returned to the surface "without traversing working places."</p> <p>As a result, the mobile dust collection exhaust should be capable of connecting to the ESF ventilation return ducts.</p> <p style="text-align: right;">B.MI.BC.002</p> | <p>Agree to the option that the mobile dust collection exhaust should be capable of connecting to the ESF ventilation return ducts where it is feasible.</p> <p>Disagree to the base interpretation of CFR 30, Part 32.9 which the commentor implies that air carrying diesel exhaust gases be directed to return airways. Part 32.9 states: "If possible... where diesel equipment is used...air carrying exhaust gases from the engine is returned...without traversing working places."</p> <p>Ventilation of diesel equipment dilutes diesel exhaust gases below threshold limit values for human exposure. It is unavoidable for diesel equipment to work in the fresh intake air shaft station and consider the main intake air contaminated and unfit for the workers at the face.</p> |
| 147 | FS-SP-1109 PAGE 1 | <p>The concept of local dust control using mobile collectors is not applicable to dust entrained by muck haulage and utility traffic. In light of the constraints placed on the ventilation system by SDRD 1.2.6.7.4, an</p> | <p>Agree. Regular application of chemical additives to suppress dust along roadways will be included in Title II design. A 500 gallon mobile tank to contain the chemical mix will be designed. Detail will be included in Title II detailed specifications.</p> |

COMMENT RESOLUTION CONTINUATION SHEETNE90102
7-88

Page 51

Document Title **ESF 100% TECHNICAL REVIEW TITLE I**
 F&S Mining

| COMMENT NO. | PAGE | REVIEWER'S COMMENTS | RESOLUTION |
|----------------|------|--|------------|
| | | <p>additional system should be provided for control of dust on the main traffic routes of the MTL and exploratory drifts. This might be accomplished using part of the ventilation system or by using auxiliary controls such as chemical dust suppressants.</p> <p style="text-align: right;">B.MI.BC.004</p> | |

4.0 Technical Assessment Review Plan



Department of Energy

Nevada Operations Office
P. O. Box 98518
Las Vegas, NV 89193-8518

JUN 21 1988

NNA 880622-0003

Michael E. Spaeth
Technical Project Officer
for NNWSI
ATTN: G. Kenton Beall
Science Applications
International Corporation
Suite 407
101 Convention Center Drive
Las Vegas, NV 89109

REMOTE FACILITIES FOR THE 100 PERCENT TITLE I EXPLORATORY SHAFT FACILITY (ESF)
DESIGN REVIEW (WMPO ACTION ITEM 88-2079)

Science Applications International Corporation (SAIC) is authorized to conduct and procure meeting spaces and other support required for the ESF 100 Percent Title I Design Review, at a location remote from the SAIC offices in Las Vegas, Nevada. The meeting dates will be from early August to mid-September 1988. Please prepare a Design Review Plan for the 100 percent review and submit it to the Waste Management Project Office for approval.

If you have any questions regarding this matter, please contact Dennis H. Irby at 794-7932.

Lester P. Skousen, Chief
Technology Development and
Engineering Branch
Waste Management Project Office

WMPO:DHI-2452

cc:

V. J. Cassella, HQ (RW-123) FORS
Dean Stucker, HQ (RW-223) FORS
M. C. Brake, SAIC, Las Vegas, NV
G. K. Beall, SAIC, Las Vegas, NV
R. R. Reust, SAIC, Las Vegas, NV
J. G. Reiser, SAIC, Las Vegas, NV
S. H. Klein, SAIC, Las Vegas, NV
V. E. Narrows, SAIC, Las Vegas, NV
S. C. Smith, SAIC, Las Vegas, NV
James Blaylock, WMPO, NV
M. P. Kunich, WMPO, NV

SAIC/T & MCS

JUN 21 1988

CCF RECEIVED



Science Applications International Corporation

L88-ESF-JGR-037
NBS # 1.2.6.1
QA Level: III

August 1, 1988

Carl P. Gertz, Project Manager
Waste Management Project Office
U.S. Department of Energy
Nevada Operations Office
P.O. Box 98518
Las Vegas, NV 89193-8518

Attention: Lester P. Skousen

Subject: Contract #DE-AC08-87NV10576
Title I - Technical Assessment Review Plan for the Exploratory Shaft
Facility (ESF) at 100 Percent Design Completion

Reference: Letter Skousen to Spaeth, dated June 21, 1988

Dear Mr. Gertz:

In accordance with your request, per the reference, for Science Applications International Corporation to prepare a Plan, which supplements QMP-02-08, for the subject review, I am pleased to transmit a copy of the Plan for your review, comment, and approval. The Technical Assessment Review Plan includes the dates, location, scope of work, instructions to reviewers, reviewer's qualifications, and other pertinent information, and satisfies the requirements of Section 3.2 Technical Assessment Review Notice of QMP-02-08. As WMFO responsible designee, SAIC will conduct the Technical Assessment Review in accordance with the approved plan.

Briefly, this Technical Review Plan has been adapted from the Waste Management Project Office Title I Design Review for the ESF at 50 Percent Completion. The purpose of the Plan is to provide a Review of the ESF Title I Design at 100 Percent Completion and document the review comments and resolutions according to the subject Plan.

Should additional information be required, please contact G. Kenton Beall at 794-7829.

Sincerely,

SCIENCE APPLICATIONS
INTERNATIONAL CORPORATION

Michael E. Spaeth
Project Manager

MES:JGR:gg

Carl P. Gertz
L88-ESF-JGR-037
August 1, 1988
Page Two

Enclosure:
As stated

cc w/encl:

D. H. Irby, WMPO, NV
James Blaylock, WMPO, NV
E. L. Wilmot, WMPO, NV
G. K. Beall, SAIC, Las Vegas, NV
S. H. Klein, SAIC, Las Vegas, NV
M. E. Spaeth, SAIC, Las Vegas, NV
J. G. Reiser, SAIC, Las Vegas, NV

NNWSI Project

AUG 01 1988

CRF Received

Rev. 1
8/3/88


**TITLE I - TECHNICAL ASSESSMENT REVIEW PLAN
FOR THE EXPLORATORY SHAFT FACILITY (ESF)
AT 100 PERCENT DESIGN COMPLETION**

AUGUST/SEPTEMBER 1988

**SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
LAS VEGAS, NEVADA**

**TITLE I - TECHNICAL ASSESSMENT REVIEW PLAN
FOR THE ESF AT 100 PERCENT DESIGN COMPLETION**

The Science Applications International Corporation (SAIC) Plan for the Title I - Technical Assessment Review (TAR) for the ESF at 100 Percent Design Completion is approved. SAIC, the WMPO designee, is authorized to conduct the TAR according to this Plan, as indicated by the appropriate U.S. Department of Energy (DOE)/Waste Management Project Office (WMPO) signatures below:


L. P. Skousen, Chief
Technology Development and
Engineering Branch

8/2/88
Date


James Blaylock,
Project Quality Manager

8/2/88
Date


C. F. Gertz, Project Manager
Waste Management Project Office

8/2/88
Date

**TITLE I - TECHNICAL ASSESSMENT REVIEW PLAN
FOR THE ESP AT 100 PERCENT DESIGN COMPLETION**

Revision 1 8/3/88

Changes shown in the plan text on the Title Page, Table of Contents, and Pages 1 are shown and are approved as indicated by the appropriate U.S. Department of Energy (DOE) Waste Management Project Office's (WMPO) Signatures below:


L. P. Skousen, Chief
Technology Development and
Engineering Branch

8/5/88
Date


James Blaylock,
Project Quality Manager

8/5/88
Date


C. P. Gertz, Project Manager
Waste Management Project Office

8/5/88
Date

TABLE OF CONTENTS

| <u>Section</u> | <u>Page</u> |
|--|-------------|
| Plan Approval | ii |
| Table of Contents | iv |
| 1.0 Preface | |
| 1.1 Introduction | |
| 1.2 Technical Assessment Review Definition | |
| 2.0 Scope | 1 |
| 3.0 Plan Basis | 2 |
| 3.1 Organizations | 2 |
| 3.2 Technical Review Team Selection | 3 |
| 3.3 Location/Time | 3 |
| Figure I - SAIC Technical Assessment Review Committee TARC Members | 4 |
| Figure II - Lead Representatives for Participating Organizations | 5 |
| Figure III - Review Meeting Location | 6 |
| 4.0 Technical Assessment Review Process | 7 |
| 4.1 Pre-Review | 7 |
| 4.2 Review Process Outline | 7 |
| Figure IV - Scope of Work for Reviewing Organizations | 8 |
| Figure V - WMPO Proficiency Review Report (N-QA-007) | 9 |
| Figure VI - WMPO Proficiency Review Report (Example) | 10 |
| Figure VII - SAIC TARC Discipline Coordinators | 12 |
| Figure VIII - Reviewers Comment Sheet (RCS) | 13 |
| Figure IX - Reviewers Comment Continuation Sheet | 14 |
| Figure X - Discipline Resolution Sheet (DRS) | 15 |
| Figure XI - Discipline Resolution Continuation Sheet | 16 |
| 4.2.1 Instructions to Reviewers | 17 |
| Figure XII - ESF Title I - 100 Percent Technical Assessment Review - Comment Resolution Designation Authority | 20 |
| Figure XIII - ESF Title I - 100 Percent Technical Assessment Review - Comment Resolution Concurrence | 21 |
| 4.2.2 Comment/Resolution Development | 22 |
| 4.2.3 Comment Identification Number Definition | 24 |
| 4.3 Review Record Memorandum | 25 |
| 5.0 Schedule/Activities | 25 |
| 5.1 Calendar Days Activities | 25 |
| Figure XIV - ESF Title I - 100 Percent Technical Assessment Review Schedule | 26 |
| 6.0 Acronyms | 27 |

1.0 PREFACE

1.1 INTRODUCTION

The ESF Architect/Engineers (A/Es) are currently completing the Title I Design activities for the ESF. Part of the contractual agreements between the A/Es and the WMPO, is for the A/Es to submit all of the ESF design documents (drawings and specifications) at 100 percent design completion for a WMPO Technical Assessment Review. SAIC will plan, organize, conduct, document, and coordinate, the Technical Assessment Review. This plan satisfies the purpose and scope of QMP-02-08 Sections 1.0 and 4.1.2.

SAIC will conduct this Technical Assessment Review in accordance with the WMPO QMP-02-08 and this Plan. This Plan, which supplements QMP-02-08, defines the logistics and methodologies by which the review process shall be implemented. In addition, SAIC will integrate the Review of other selected organizations and conduct comment resolution meetings. Subsequent to the review's completion, a final review report, titled Review Record Memorandum (RRM) shall document the review activities including the comment resolutions. The RRM, in addition to being provided to DOE/WMPO and participating organizations, shall be placed by the TARC Chairperson into the SAIC Correspondence Control Facility for retention and retrieval upon request, this satisfies QMP-02-08 Section 5.6.

1.2 Technical Assessment Review Definitions

This Technical Assessment Review is being conducted by the DOE and other participating organizations in accordance with DOE Order 4700.1, Project Management System, Attachment III-1, Section 2 Technical Reviews, paragraph Preliminary Design (Title I) Review, which states "This Review is conducted in order to: a) Evaluate the progress, technical adequacy, and risk resolution (on a technical, cost, and schedule basis) of the selected design approach; b) determine its compatibility with performance and engineering specialty requirements of the development specification [in the case of the Nevada Nuclear Waste Storage Investigations Project (NNWSI) Project ESF Subsystems Design Requirements Document (SDRD) and other ESF Baselined Design Basis Requirements Documents]; and c) establish the existence and compatibility of the physical and functional interfaces among facilities, hardware, software, personnel, and procedures." This Technical Review Plan was adapted from the NNWSI Project ESF Title I - Design Review Plan for the ESF at 50 Percent Completion. This section satisfies QMP-02-08 Sections 2.0 and 3.0.

2.0 SCOPE

The scope of this Plan is to provide a Technical Assessment Review of the ESF Title I Design at 100 percent completion and to document the review comments and resolution according to this Plan's requirements. The review must determine whether the design meets the criteria required by the Office of Civilian Radioactive Waste Management and the Office of Geologic Repositories for the ESF. Included among the criteria is the need to assess the appropriate ESF

Design features with the GRD/Appendix E for regulatory compliance with 10 CRF 60 requirements. For the NWSI Project, these criteria are set forth in the ESF SDRD, Volumes I and II; the NWSI Project Reference Information Base (RIB); the NWSI Project ESF Design Scope and Planning Document for Title I Design, prepared by Fenix and Scisson, Inc. (F&S); the NWSI Project ESF Basis for Design, prepared by F&S; the ESF Title I Scope and Planning Basis Document for the NWSI Project, prepared by Holmes and Narver, Inc. (H&N); the ESF Title I Design Basis Document, prepared by H&N; all codes and standards specified in these documents; and the Nuclear Waste Repository in Tuff Subsurface Facility Conceptual Design ESF/Repository Interface Control Drawing Number R07048A, Sheets 1-15, prepared by Sandia National Laboratories (SNL).

This review is to assess the compliance of the A/Es prepared Technical Assessment Review packages (Designs, specifications, etc.) to the design requirements provided to them. Valid assessments which may impact the approved design requirements provided to the A/E will be addressed outside of this review process, using existing WMPO change procedures.

3.0 PLAN BASIS

3.1 Organizations

The following organizations will participate in the Technical Assessment Review:

- U.S. Department of Energy/Headquarters (DOE/HQ)
- Nevada Operations Office/Safety and Health Division (NVO/SHD)
- Nevada Test Site Operations (SSD)
- Nevada Test Site Operations (HPED)
- Nevada Test Site Operations (NTSO)
- WMPO
- Weston
- SAIC
- U.S. Army Corps of Engineers (COE)
- Mine Safety and Health Administration (MSHA)
- Bureau of Mines (B of M)
- Reynolds Electrical and Engineering Company (REECo)
- Los Alamos National Laboratory (Los Alamos)
- U.S. Geological Survey (USGS)
- SNL
- Lawrence Livermore National Laboratory (LLNL)
- NVO/ISD

The following organizations will provide observers at the Technical Assessment Review:

- U.S. Nuclear Regulatory Commission
- The State of Nevada
- University of Nevada - Las Vegas
- University of Nevada - Reno

SAIC will provide a multidiscipline group of personnel, Technical Assessment Review Committee (TARC) qualified in their chosen disciplines as part of Technical Review Team.

The TARC is composed of a Review Chairman, a Review Secretary, one representative of each specific design discipline, a Quality Assurance (QA) Specialist, and Regulatory Compliance, and others as appropriate (Figure I). Participating Organizations, in addition to providing Reviewers, shall designate a Lead Representative for their respective organization, (Figure II)

It is the TARC's role, in addition to providing review comments, to integrate the comments from each outside reviewing organization into one set of comments to be presented to the A/Es for resolution. The TARC Chairman shall coordinate all efforts between the SAIC, the outside reviewing organizations, and the A/Es.

3.2 Technical Review Assessment Team Selection

Team Members selection is based on the individual's qualifications of his or her technical/scientific speciality, as a competent reviewer representative for the scope of work identified for each respective participating organization. Team Members will, in their respective areas of competency be as qualified as those who, on the staff of the A/Es, prepared the Exploratory Shaft Facilities surface and underground works, engineering designs, and specifications, in accordance with the WMPO design requirements.

In order to meet the above qualification, Team Members will as a minimum, possess a Bachelors Degree and five years of experience or the demonstrated equivalency of training and experience in their area of expertise. Team Members' qualifications will be certified and documented by the Team Members' supervision. Documentation will be prepared on WMPO Proficiency Review Report, Form No. N-QA-007 and provided to the Technical Review Committee Secretary on or before the first day of the start of the review process. Background data/material which substantiates the qualification certification will be retained at the reviewer's organization. Prior to the destruction of such material notice shall be given to the WMPO. Background data/material may be subjected to audit by personnel from the Nuclear Regulatory Commission or the U.S. Department of Energy. The completed form N-QA-007 shall be included in the RRM. The above satisfies QMP-02-08, Section 5.2.

3.3 Location/Time

To accomplish a technical review of a large number of drawings and specifications in the time allocated, SAIC requires a concentrated effort by all designated reviewers at a single location away from their respective offices. A single location simplifies the review process by eliminating those problems associated with multioffice reviews (i.e., document transmittals, reference material, misunderstood comments and resolutions, and conflicting work commitments of the Reviewers). The designated location is at the Henderson Convention Center, Henderson, Nevada, (Figure III). The review is scheduled to start on August 8, 1988, at 8 a.m.

Ken Beall

J. Reiser

P. Karnoski

J. Davenport

Reviewers

M. Brake

E. Cikanek

R. Tome'

I. Cottle

J. McConville

T. Pysto

S. Smith

A. Langstaff

S. Phillips

C. Pflum

Chairperson

Secretary

Quality Assurance

Regulatory Compliance

Discipline or Department

Civil/Structural/Architectural

Geotechnical

Mechanical

Testing

Electrical

Environmental Design

Repository/Operations

Mining/Ventilation

Safety

Regulatory Compliance

FIGURE I

SAIC TECHNICAL ASSESSMENT REVIEW COMMITTEE

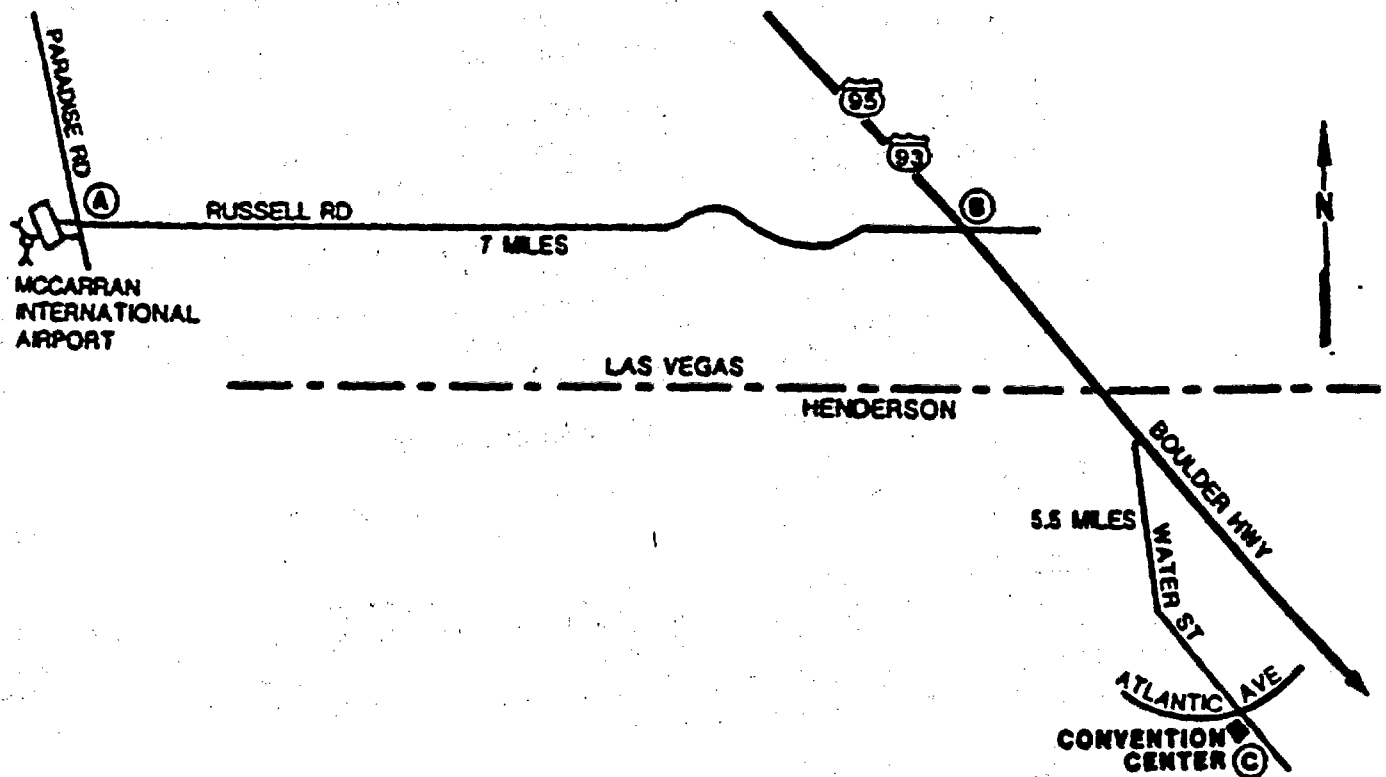
| <u>ORGANIZATION</u> | <u>REPRESENTATIVE</u> |
|---------------------|-----------------------|
| 1. DOE/HQ | D. Stur |
| 2. DOE/WMFO | D. Irby |
| 3. Roy F. Weston | J. Montgomery |
| 4. SAIC/QA | J. Jardine |
| 5. SAIC/TARC | I. Cottle |
| 6. B of M | B. Cantrell |
| 7. USGS | B. Craig |
| 8. SNL | B. Stinebaugh |
| 9. LLNL | D. Wilder |
| 10. Los Alamos | T. Merson |
| 11. NVO/SHD | D. Martin |
| 12. DOE/NTSO | A. Veloso |
| 13. REECO | D. Koss |
| 14. COE | E. Jensen |
| 15. MSHA | R. Breland |
| 16. NVO/SSD | — |
| 17. NVO/HPED | — |
| ADDED 18. NVO/ISD | DEAN BROGAN |

(1) This is a tentative list and will be confirmed by the participating organizations on the first official day of the review proceedings.

FIGURE II

LEAD REPRESENTATIVES FOR PARTICIPATING ORGANIZATIONS (1)

**HENDERSON CONVENTION CENTER
200 WATER STREET
HENDERSON, NEVADA 89015**



DIRECTIONS FROM AIRPORT TO HENDERSON CONVENTION CENTER

- A. Out of McCarran Airport to corner of Paradise Avenue and Russell Road.
- B. East on Russell Road to Boulder Highway (93 & 95) - 7 miles.
- C. South on Boulder Highway to Convention Center (on southwest corner) - 5.5 miles

FIGURE III - REVIEW MEETING LOCATION

4.0 TECHNICAL ASSESSMENT REVIEW PROCESS

4.1 Pre-Review

A formal request has been received by SAIC from the WMPO as design to conduct a multiple participating organizations Technical Assessment Review.

The Review Technical Assessment Committee Secretary shall contact the WMPO and obtain the list of reviewing organizations and approved scope of review for each group (Figure IV). A Technical Assessment Review Notice announcing the planned review shall be sent to each reviewing organization. The Review Notice shall focus on the plan, dates, location, scope of work, review process outline, and any other pertinent or background information necessary for the review. The Review Notice shall also request reviewers names, qualifications, and commitment for the review period.

The reviewing organizations shall send a list of reviewers with qualifications according to the Scope of Work, Figure IV in the Plan, using form N-QA-007 as indicated in Figures V, and VI respectively.

Reviewers shall be required to complete the WMPO QA training prior to the acceptance of their comments into the review process. It is emphasized that an integral part of the Reviewer's qualification training completion and his/her commitment for the review period are that each reviewer, as a minimum, be in attendance during the following:

- o Review Presentation and Indoctrination
- o Review period
- o Reviewer comment disposition (transmit or not to transmit comment to A/Es)

SAIC shall reserve meeting rooms, provide for logistical support (i.e., secretarial, copying, etc.) and shall also obtain the appropriate number of drawings and specification copies to provide each reviewer with a complete set for the area being reviewed. Calculations may be requested as required from the A/Es during the review period.

4.2 Review Process Outline

The Presentation Meeting will be held in Henderson, Nevada, on the first day of the review. The A/Es will present a design overview by discipline, followed by Review indoctrination by SAIC to provide guidance on the scope of the review and comment content. Attendance at this presentation shall be documented as part of the review record. Subsequent to the completion of the design presentation and work shops, the A/Es will present their Technical Assessment Review Package to the review Team Members to be assessed. The above satisfies QMP-02-08, Section 3.4 and 4.2, compile a data package for review.

The main points of guidance to the Reviewers will be:

1. Purpose and scope.
2. Participants and their responsibility.
3. Comment guidelines.
4. Review Forms completion.

1. DOE/HQ/Weston - Review for compliance to Program Requirements, constructibility, operations, maintenance, and safety (10 CFR 60).
2. REECo - Review for constructibility, use of standard construction practices, quality control, operations, maintenance, and safety (industrial/worker).
3. SAIC - Review of general compliance with Program Requirements, standard construction practices, and environmental permitting compliance, and regulatory compliance.
4. WMPO - Review for general compliance with Program Requirements.
5. COE - Review for general compliance with regulations for site preparation and civil works, constructibility, and use of standard construction practices.
6. MSHA - Review for general compliance with MSHA regulations and standard safety practices, and for use of standard construction practices.
7. B of M - Review for mining technology applications with respect to controlled blasting and blast effect on instrumentation, dust abatement and control, diesel emissions at surface and underground works, and drift and pillar stability design.
8. USGS - Review for adequacy to support ESF in situ characterization testing needs.
9. SNL - Review for general compliance with site and engineering properties data base identified in the RIB, adequacy to support ESF in situ site characterization testing needs, and compatibility of ESF permanent items which will be incorporated into the repository. Design features of the ESF for regulatory compliance with 10 CFR 60 requirements, as defined in the DOE Generic Requirements Document, Appendix E for the ESF.
10. LLNL - Review for general compliance with the waste package interfaces and for adequacy to support ESF in situ site characterization testing needs.
11. Los Alamos - Review for adequacy to support in situ site characterization testing needs.
12. NVO/SHD - Review for compliance to health and safety regulations.
13. NTSO - Review with respect to security concerns and for compatibility/interface with present on-site utilities, buildings, roads, maintenance facilities, etc.
14. NVO/SSD - Review with respect to physical security concerns.
15. NVO/HPED - Review for environmental compliance with regulations.

FIGURE IV

SCOPE OF WORK FOR REVIEWING ORGANIZATION

Review Date _____

Name _____ Title _____

The proficiency review is based on the experience, knowledge and training of the individual. The activities the individual is capable to perform are listed below.

Activities

Proficiency Report Conducted and Certified by

Signature _____ Title _____

Date _____

NOTE: This report should be completed on an annual basis.

FIGURE V - WMPO PROFICIENCY REVIEW REPORT FORM



WMPO PROFICIENCY REVIEW REPORT

M-01-007
GMS

Name I. A. REVIEWER Review Date May 4, 1988
Title Senior Mining Engineer

The proficiency review is based on the experience, knowledge and training of the individual. The activities the individual is capable to perform are listed below.

Activities Based upon a review of MR REVIEWER'S education and employment history,
he is fully qualified to serve on the Title II TECHNICAL Review Board. Mr. REVIEWER
holds a B.S. degree in Mining Engineering from the Colorado School of Mines. He
was employed by Amax Inc. at the Urad and Henderson mines in various capacities
including ventilation engineer, mine planning engineer, underground surveyor, and
blasting crew miner. Subsequently, MR. REVIEWER was employed by Cleveland Cliffs
where he was responsible for completion of feasibility studies. Duties included
design of mine layouts, ventilation system design, equipment selection and material
handling system design. Prior to joining the ABC Co. team he was employed by
Westinghouse Hanford on the Basalt Waste Isolation Project where he was responsible
for providing mining expertise and guidance for design of the BWIP exploratory shaft
facility. Assignments included leading a study group reviewing changes in mine
regulations, direction of Architect Engineer contractor and team leader of a group
defining design recommendations for the underground facility.

Proficiency Report Conducted and Certified by

Signature H.S. SUPERVISOR Title Integration Mining Manager

Date MAY 4, 1988

NOTE: This report should be completed on an annual basis.

FIGURE VI - WMPO PROFICIENCY REVIEW REPORT EXAMPLE

Conflicts are referred, with a documented recommendation by the TARC Chairperson, to the appropriate TPO for conflict resolution. The TPO documents the resolution of the conflict to the Chairperson and the responsible WMPO branch chief. The joint resolution meeting will begin 18 calendar days after final comment disposition to allow time for comments to be properly consolidated and proposed resolutions prepared by the A/Es. This satisfies QMP-02-08 Section 5.5.3 and 5.5.5.

Closure of Resolution, the responsible WMPO Branch Chief or designee, shall ensure that the appropriate TPO satisfies and closes out the commitments made in resolutions to the Technical Assessment Review Comments. This satisfies QMP-02-08 Section 5.7.

Information needs on the forms shown on the figures in QMP-02-08 for documentation of the Technical Assessment Review Comment Record is provided for by a suitable alternative which enables computerization of the comment/resolution process. The Review Comment Record form shown in QMP-02-08 is reformed for this plan into two forms namely: 1) Reviewer's Comment Sheet (Figure VIII) and Discipline Resolution Sheet (Figure X), including appropriate continuation sheets. This satisfies QMP-02-08, Section 7.0, Figures 3 and 4.

| <u>Category⁽¹⁾</u> | <u>SAIC Principal Coordinator</u> | <u>Support Coordinators</u> |
|-------------------------------|-----------------------------------|-----------------------------|
| General | I. Cottle | S. Smith |
| Civil/Architectural | M. Brake | I. Cottle |
| Mechanical | R. Tome' | None (as necessary) |
| Electrical | J. McConville | None (as necessary) |
| Mining | S. Smith | A. Langstaff/E. Cikanek |
| Shafts | I. Cottle | E. Cikanek/S. Smith |

(1) Specification shall be reviewed within the category.

Figure VII

SAIC TARC DISCIPLINE COORDINATORS

REVIEWER'S COMMENT SHEET

N-E8-001
7/88

Document Originator _____

Date _____

Document Title _____

Name of Reviewer _____

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

Reviewer

Date

Discipline Coordinator

Date

QA Representative

Date

COMMENT
NO.
& TYPE

PAGE
NO.

REVIEWER'S COMMENTS

COMMENT

RESOLUTION

REVIEWER'S COMMENT CONTINUATION SHEET

N-ES-001
7/88

Document Title _____

Name of Reviewer _____

COMMENT
NO.
& TYPE

PAGE
NO.

REVIEWER'S COMMENTS

COMMENT

RESOLUTION

FIGURE IX - REVIEWER'S COMMENT CONTINUATION SHEET

DISCIPLINE RESOLUTION SHEET

N-ES-002

7/88

TECHNICAL ASSESSMENT REVIEW

Acceptance Signatures

| | |
|-------------|-------|
| _____ | _____ |
| Chairperson | Date |
| _____ | _____ |
| QA | Date |
| _____ | _____ |
| AE | Date |
| _____ | _____ |
| WMPO | Date |

Document Originator _____

Date _____

Document Title _____

Discipline Coordinator _____

COMMENT
NO.
& TYPE

PAGE
NO.

REVIEWER'S COMMENTS

COMMENT

RESOLUTION

DISCIPLINE RESOLUTION CONTINUATION SHEET

N-ES-002
7/88

Document Title _____

COMMENT
NO.
& TYPE

PAGE
NO.

REVIEWER'S COMMENTS

COMMENT

RESOLUTION

FIGURE XI - DISCIPLINE RESOLUTION CONTINUATION SHEET

4.2.1 Instructions to Reviewers

A. General Guidance

Particular attention should be given to the comment content and structuring to provide the document author with constructive and referenced or supported comments. Comments should be provided that are clear and concise, and which may be dispositioned on the RCS without dialogue to determine the meaning of the comment. The Review shall provide information which may be incorporated or expanded by the A/E's to enhance the quality of the document. Since the RCS are records which may become public information, the comments should be structured in a professional manner and with enough detail to communicate and resolve the intent of the comment.

B. Specific Guidance

1. Reviewers shall determine that their respective organization's ESF 50 Percent Title I Design Review comments/resolutions agreed to be completed at the ESF 100 Percent Title I Technical Review have been incorporated into the A/E's designs and specifications.
2. Avoid comments in the form of questions directed to the author. Make statements that can be dispositioned by the author to resolve your concerns. Questions such as, "What is the intent of...?" or "Why did you...?" or "Can you?" are not comments on the document content requiring resolution. question-type comments can be structured into constructive comments. For example, "What is the intent of...?" can be restructured to, "Provide an explanation in this section to support the intent of..."
3. Avoid comments of "More detail required," "change" or "clarify." Rather, state what additional details or clarifications are considered necessary, or state "change to..." and support the suggested change with reference or justification, or provide the additional text necessary to resolve the comment.
4. Provide supporting evidence such as a reference, or attach verified information or rationale if a comment identifies a technical error or disagreement with a conclusion.
5. If the document is a specification, give page number, paragraph, and sentence number.
6. If the document is a drawing, give specific zone number (i.e., drawing number, zone A-Z, detail 1, etc.).

4.2.1 Instructions to Reviewers (Continued)

B. Specific Guidance (Continued)

7. Give enough detail so the designated person from the reviewing organization can dispose of the comment with the A/E.
8. The Reviewer should restrict his comments to the Scope of Work designated by the WMPO (Figure IV) Page 8 for his organization and to the area of the Reviewer's qualified expertise.
9. Comments must be integrated by the reviewing organization by discipline and typed by SAIC on the appropriate forms. No correction fluids or tape may be used on the signed document. Corrections may be made by lining out the incorrect text and making additions. The original text must not be obliterated. Changes must be initialed in black ink and dated. All submitted comment forms must be signed by the Reviewer in black ink.
10. Comments must consider the stage of design completion and scope of the review.
11. It should be kept in mind that Technical Reviews are intended to improve the product and not impose alternative design choices or concepts.
12. Conflicting comments within a reviewing organization must be resolved internally by the Lead Representative before submittal for disposition.
13. The design needs to meet the requirements and should be reasonable and defensible. Refer to design criteria documents. These documents will be provided, during the meeting periods, in the library at Henderson Convention Center.
14. This Review requires that all comments shall be written on the document review sheets, as provided.
15. Editorial comments or comments on the contractual language in specifications will not be accepted.
16. Comments on the Design Basis Requirements Documents should not be prepared; they will not be accepted for transmittal to the A/Es. Change Requests to the Design basis requirements are outside the scope of this review. Such requests are processed through the WMPO using the formal change request procedures for the project.

4.2.1 Instructions to Reviewers (Continued)

B. Specific Guidance (Continued)

17. To meet the spirit and intent of the WMPO to have a single location to facilitate the review process, paragraph 3.3 Location, Reviewers are required to sign a "Reviewer Comment Resolution Designation Authority" which designates his/her signature authority to their Organization's Lead Representative. This signature authority enables the review process, as regards the Reviewer's comments to continue in the review process, in the necessary absence of the Reviewer (Figure XII).
18. In order to enable closure between the Reviewing Organizations and the Comment Resolutions developed by the A/Es, when final concurrence is reached, this concurrence shall be evidenced by the signature of the Reviewing Organization's Lead Representative on "Comment Resolution Concurrence Form", (Figure XIII). This statement satisfies the requirement of QMP-02-08, Section 5.4 that "The TARC Chairperson will review and sign and date the RRM". These forms will be included in the RRM.
19. Reviewers should note that all comments dispositioned as "transmit" to the A/Es are major comments by definition.
20. Each Reviewer is responsible for both the technical and grammatical (i.e., spelling errors, etc.) content of the submitted comments.

THE REVIEWER, NAMED BELOW, IN HIS ABSENCE DESIGNATES AND TRANSFERS COMMENT
RESOLUTION AUTHORITY AND CONCURRENCE AUTHORITY TO HIS LEAD REPRESENTATIVE.

REVIEWER: _____

ORGANIZATION NAME: _____

LEAD REPRESENTATIVE: _____

DATE: _____

FIGURE XII

ESF TITLE I - 100 PERCENT TECHNICAL ASSESSMENT REVIEW

REVIEWER COMMENT RESOLUTION DESIGNATION AUTHORITY

THE REVIEWER TEAM LEAD REPRESENTATIVE CONCURS WITH ALL THE RESOLUTIONS
DEVELOPED FOR ALL OF THE COMMENTS SUBMITTED BY HIS ORGANIZATION DURING THE
COMMENT AND RESOLUTION ACTIVITIES.

ORGANIZATION NAME: _____

LEAD REPRESENTATIVE: _____

DATE: _____

FIGURE XIII

ESF TITLE I - 100 PERCENT TECHNICAL ASSESSMENT REVIEW

COMMENT RESOLUTION CONCURRENCE

4.2.2 Comment/Resolution Development

Comment Development

Remarks

- 1) Reviewers Written Comments on RCS
Delivered to Review Control Room
typing box
In pencil on RCS
- 2) Initial Processing by SAIC Control Room
 - o Type draft
 - o Individual comment tracking numbers assigned
 - o Return to Reviewer
- 3) Draft Review and Mark-up
 - o Reviewer edits comments
 - o Lead Representative concurs with comments
 - o Return final draft comments to SAIC Control Room typing boxDirect mark-up of draft
- 4) Final Typing Input
 - o SAIC corrects and types Reviewers draft comments
 - o Printout on RCS
 - o Reviewer proof reads signs and delivers finished comments to their Lead Representative
 - o Lead Representative ensures compliance with Review requirements and initials his concurrence
 - o Lead Representative delivers final comments to Discipline Coordinator's in boxSee comment ID format (Pg. 19)

Comment Disposition

Remarks

- 1)
 - o Disposition by Designated Review/Discipline Coordinators
 - o Reviewer concurs and signs off on Reviewer line on RCS
 - o Coordinator signs and dates on Discipline coordinator line
 - o Comment Originals to Master Comment File BookAny corrections necessitate re-printing
- 2) Signoffs - RCS
 - o Chairperson/Secretary as responsible manager, sign and date in proper line
 - o QA Specialist, sign and date in proper line.

4.2.2 Comment/Resolution Development (Continued)

Comment Disposition (continued)

Remarks

- 3) Sorting and Consolidation of Comments for each A/E
 - a. By A/E
 - b. By category (Pg. 19)
 - c. By A/E drawing specification list
 - d. By comment commonalty
 - e. SAIC Control Room makes file modifications as directed by coordinator for each drawing category
- 4) Consolidation
 - o Transfers comments to DRS
- 5) Number Comments
 - o Number comments DRS consecutively within categories
- 6) Comments to A/E's
 - o Consolidated comments transmitted to A/Es for development of proposed resolutions

Computer sort
Computer sort
Computer sort
Coordinator sort

Resolution Meeting

- 1) Resolutions
 - o Resolution acceptance or rejection
 - o Resolution modification or rewrite of rejected comments
 - o Concurrence on all resolutions
- 2) Comment/Resolution Consolidation
 - o Comment and resolution typed on DRS
 - o Resolution modifications or rewrites to be reviewed by appropriate SAIC Discipline Coordinators for accuracy and consistency

Review Record Memorandum

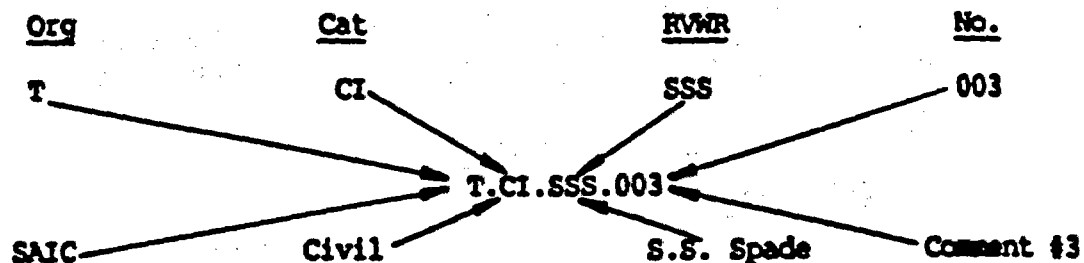
- o All inclusive report
- o Findings and recommendations by TARC

4.2.3 Comment Identification Number Definition

1) Format

- o Organization (Org)
- o Category (Cat)
- o Reviewer (RVWR)
- o Number (No.)

EXAMPLE



| <u>Category (1)</u> | <u>Codes</u> | <u>Organization</u> | <u>Codes</u> | <u>Reviewer Codes</u> |
|---------------------|--------------|---------------------|--------------|------------------------|
| 1. General | GE | 1. DOE/HQ | Q | o Three initials |
| 2. Civil | CI | 2. NVO/SHD | N | o Duplications |
| 3. Mechanical | ME | 3. NTSO | E | modified as |
| 4. Structural | ST | 4. WFO | J | needed |
| 5. Architectural | AR | 5. Weston | K | |
| 6. Electrical | EL | 6. SAIC | T | |
| 7. Mining | MI | 7. Corps of Eng. | C | |
| 8. Shaft | SH | 8. MSHA | M | |
| 9. Specifications | SP | 9. BOM | B | |
| | | 10. REECO | R | Reviewer's Consecutive |
| | | 11. Los Alamos | A | Comment Numbers |
| | | 12. USGS | G | 001 thru 999 |
| | | 13. Sandia | S | |
| | | 14. LLNL | L | |
| | | 15. NVO/SSD | D | |
| | | 16. NVO/HPED | H | |

- o Ascending numbering within each designated category (9 categories above)

4.3 Review Record Memorandum

The Review Secretary collects and prepares and the Review Chairman shall issue a final report in the form of a Review Record Memorandum (RRM) to the WMPO and each reviewing organization on the final comment resolution. The RRM shall be signed by the SAIC Technical Assessment Review Committee Chairperson. This memorandum shall be issued 30 calendar days after the final joint resolution meeting.

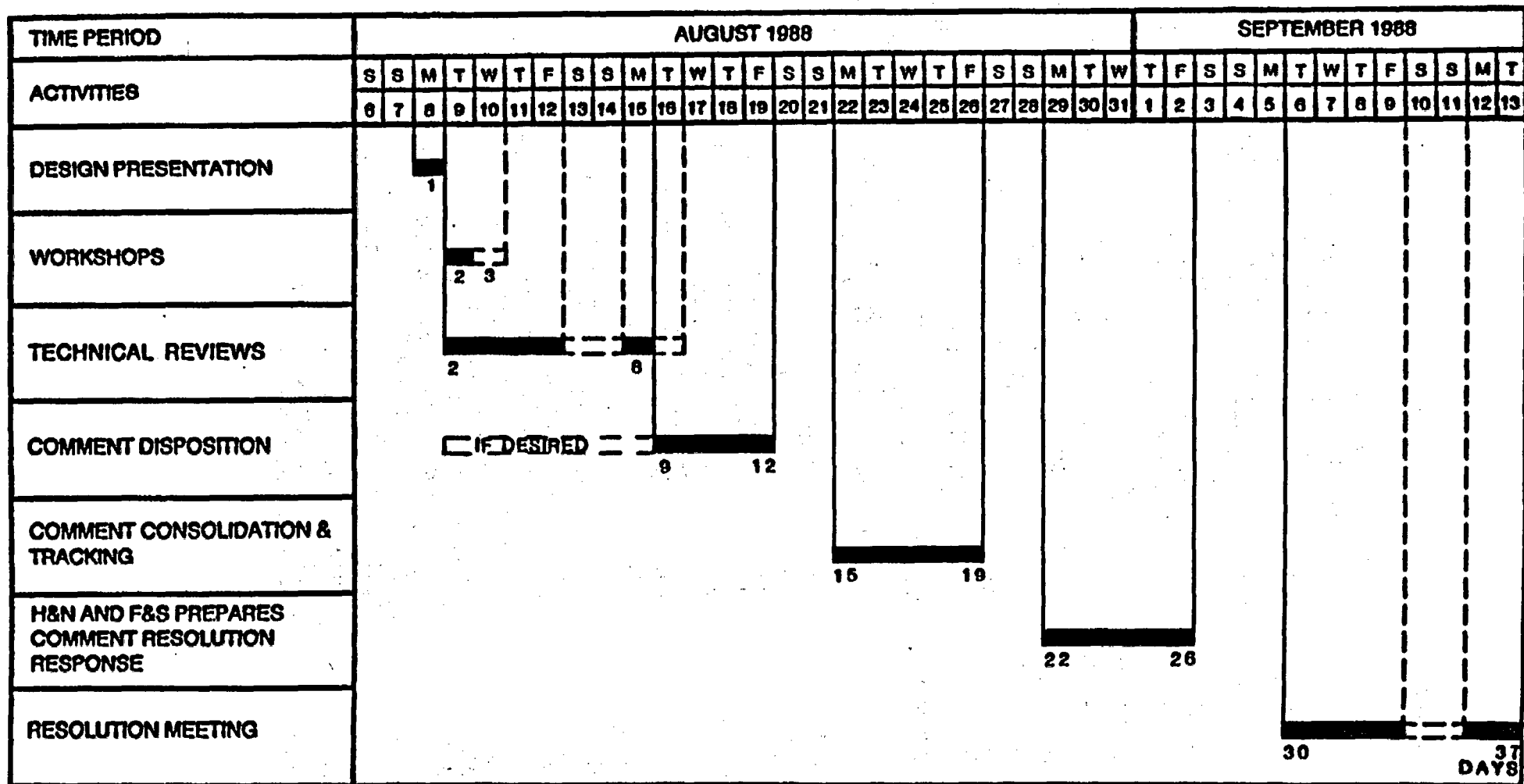
5.0 SCHEDULE/ACTIVITIES

All major milestones required to meet the current review schedule are shown on (Figure XIV) of this Plan. The Review activities in Henderson, Nevada, will be scheduled as follows:

5.1 Calendar Days Activities

| <u>Calendar Day</u> | <u>Activity</u> |
|---------------------|--|
| 1 | Review Presentation Meeting |
| 2 - 8 | Review and Workshops |
| 9 - 12 | Review and completion of comment disposition by SAIC |
| 15 - 19 | Comment consolidation and tracking by SAIC |
| 22 | Comment due to A/Es |
| 22 - 26 | Comment response preparation by H&N and F&S |
| 30 - 37 | Comment resolution with review organization representatives and A/Es |
| 67 | SAIC RRM to the WMPO and reviewing organizations |

FIGURE XIV - ESF TITLE I - 100 PERCENT TECHNICAL ASSESSMENT REVIEW SCHEDULE



6.0 Acronyms

| | |
|--------------|--|
| A/Es | Architect/Engineers |
| B of M | U.S. Department of Interior, Bureau of Mines |
| COE | U.S. Army Corps of Engineers |
| DOE/HQ | U.S. Department of Energy/Headquarters |
| DOE/NVO | U.S. Department of Energy/Nevada Field Operations |
| DOE/NVO-HPED | U.S. Department of Energy/NOV-Health Physics and Environmental Division |
| DOE/NVO-SHD | U.S. Department of Energy/NVO-Safety and Health Division |
| DOE/NVO-SSD | U.S. Department of Energy/NVO-Safeguards and Security Division |
| DOE/NTSO | U.S. Department of Energy/Nevada Test Site Operations |
| DOE/OCRWM | U.S. Department of Energy/Office of Civilian Radioactive Waste Management |
| DOE/OGR | U.S. Department of Energy/Office of Geologic Repositories |
| DOE/WMFO | U.S. Department of Energy/Waste Management Project Office |
| DRS | Discipline Review Sheet |
| ESF | Exploratory Shaft Facility (Surface, Shafts, Underground) |
| F&S | Fenix and Scisson, Inc. |
| GRD/APP. E | OCRWM Generic Requirements for a Mined Geologic Disposal System/Attachment I, Appendix E, Generic Requirements for Exploratory Shaft Facility (ESF) Design, Construction, and Operations |
| H&N | Holmes and Narver, Inc. |
| Los Alamos | Los Alamos National Laboratory |
| LLNL | Lawrence Livermore National Laboratory |
| MSHA | Mine Safety and Health Administration |
| NWWSI | Nevada Nuclear Waste Storage Investigations |
| NRC | U.S. Nuclear Regulatory Commission |
| QA | Quality Assurance |
| RCS | Reviewers Comment Sheet |
| REECO | Reynolds Electrical and Engineering Co., Inc. |
| RIB | Reference Information Base |
| RRM | Review Record Memorandum |
| SAIC | Science Applications International Corporation |
| SDRD | Subsystems Design Requirements Document |
| SNL | Sandia National Laboratories |
| TAR | Technical Assessment Review |
| TARC | SAIC Technical Assessment Review Committee |
| TRC | SAIC Technical Review Committee |
| TARP | Title I - Technical Assessment Review Plan for the ESF at 100 Percent Design |
| UNLV | University of Nevada - Las Vegas |
| UNR | University of Nevada - Reno |
| USGS | U.S. Geological Survey |

WASTE MANAGEMENT PROJECT OFFICE

QUALITY MANAGEMENT PROCEDURE

NO. 159

N-QA-015
12/87

Title

TECHNICAL ASSESSMENT REVIEW

No. QMP-01-08

Rev. 0

Effective Date 08-Aug-1988

Page 1 of 12

1.0 PURPOSE AND SCOPE

This procedure defines the method to be used and responsibilities for performing Technical Assessment Reviews for the Nevada Nuclear Waste Storage Investigations (NNWSI) Project. The requirements of this procedure may be supplemented with further documented guidance that defines the logistics and methodologies to be used in a review.

2.0 APPLICABILITY

This procedure applies to Technical Assessment Reviews conducted by the Waste Management Project Office (WMPO) for the NNWSI Project. A Technical Assessment Review is one of a set of review methods defined for the NNWSI Project in Section 4.2.5 of the Systems Engineering Management Plan (SEMP). This procedure can be used in meeting the requirements for technical reviews defined in the SEMF and in U.S. Department of Energy (DOE) Order 4700.1, Attachment III-1, Page III-47, Section 2.

3.0 DEFINITIONS

3.1 TECHNICAL ASSESSMENT REVIEW

The Technical Assessment Review is a documented evaluation of technical status, technical progress, or technical merit, in combination or separately. It is performed by qualified individuals other than those who performed the technical work being reviewed, but who may be from the same organization. Technical Assessment Review is a management method that may be used to accomplish such items as the following:

1. Assessing requirements.
2. Determining the degree to which technical work meets requirements.
3. Identifying technical issues in a timely fashion, including interfaces with site and design efforts.
4. Assessing the technical status or technical progress of activities.
5. Providing a basis to accept technical services rendered.

APPROVED BY

Project Manager, T&MS

Date

3 August 1988

WMPO Project Quality Manager

Wendell B. Marshall
for J. B. Black
Date 08/03/88

WMPO Project Manager

Date 8/4/88



WASTE MANAGEMENT PROJECT OFFICE

QUALITY MANAGEMENT PROCEDURE

N-QA-01
'87

Title

TECHNICAL ASSESSMENT REVIEW

No. QMP-02-08

Rev. 0

Effective Date 08-Aug-1988

Page 2 of 12

6. Defining and directing necessary changes in accordance with WMPO procedures.

3.2 TECHNICAL ASSESSMENT REVIEW NOTICE

The Technical Assessment Review Notice (Figure 1) is issued by the responsible WMPO Branch Chief, or designee, announcing the Technical Assessment Review. The notice provides the following:

1. Technical Assessment Review scope and purpose, identifying areas and items to be assessed, including an indication of the required depth. This may be accomplished in a variety of ways, including the use of questionnaires, checklists, a list of design requirements, or through other suitable means.
2. Date, time, location, and other logistical information for the Technical Assessment Review meeting.
3. Name of the Technical Assessment Review Team Chairperson.

3.3 TECHNICAL ASSESSMENT REVIEW TEAM SELECTION RECORD

3.3.1 The Technical Assessment Review Team Selection Record (Figure 2) is completed, signed, and dated by the Technical Assessment Review Team Chairperson. It identifies the functions involved in the review, and the names of qualified individuals selected to be on the Technical Assessment Review Team. The review team members are assigned the responsibility for reviewing and providing comments, as applicable, for those functions. The review team members must be other than those who performed the technical work, but they may be from the same organization.

3.3.2 The Technical Assessment Review Team Selection Record includes the documentation of the qualifications of the review team members assigned for the various review functions.

3.4 TECHNICAL ASSESSMENT REVIEW PACKAGE

The Technical Assessment Review Package is a collection of documents (e.g., reports, schedules, plans, and drawings) that provides the information to be assessed by the review team members to achieve the established scope and purpose.



WASTE MANAGEMENT PROJECT OFFICE
QUALITY MANAGEMENT PROCEDURE

N-QA-016
7/87

Title

TECHNICAL ASSESSMENT REVIEW

No. QMP-02-08

Rev. 0

Effective Date 08-Aug-1988

Page 3 of 12

3.5 REVIEW RECORD MEMORANDUM

The Review Record Memorandum is a documented summary of the Technical Assessment Review prepared by the Secretary, which includes the following:

1. Scope of the review.
2. Technical Assessment Review Notice.
3. Technical Assessment Review Meeting minutes.
4. Technical Assessment Review Team Selection Record.
5. Technical Assessment Review Comment Records identifying comments and resolutions.
6. List of meeting attendees and, when specified, their Technical Assessment Review responsibilities.
7. Correspondence relating to the Technical Assessment Review.
8. Information presented during the Technical Assessment Review meeting and other information provided to the review team members that was not contained in the original Technical Assessment Review Package or in subsequent additions or modifications to the package.
9. Conclusions and recommendations.

3.6 TECHNICAL ASSESSMENT REVIEW COMMENT RECORD

The Technical Assessment Review Comment Record is a form used to document Technical Assessment Review comments and their resolution (Figures 3 and 4).

3.7 TECHNICAL ASSESSMENT REVIEW DATA PACKAGE

The Technical Assessment Review Package is a set of Quality Assurance (QA) records consisting of the Technical Assessment Review Package and the Review Record Memorandum, including any supplements as described in Section 5.5.6.

4.0 RESPONSIBILITIES

4.1 RESPONSIBLE WMPO BRANCH CHIEF OR DESIGNEE

4.1.1 The responsible WMPO Branch Chief or designee shall plan, schedule, and announce the Technical Assessment Review, designate the Technical Assessment Review Chairperson, and distribute the Review Record Memorandum.



WASTE MANAGEMENT PROJECT OFFICE

QUALITY MANAGEMENT PROCEDURE

N-QA-01
7/87

Title

TECHNICAL ASSESSMENT REVIEW

No. QMP-02-08

Rev. 0

Effective Date 08-Aug-1988

Page 4 of 12

4.1.2 If the responsible WMPO Branch Chief determines that a Project Participant is to be the designee, the responsible WMPO Branch Chief shall document that decision and the designated organization shall prepare and issue the Technical Assessment Review Notice.

4.2 TECHNICAL ASSESSMENT REVIEW CHAIRPERSON

The Technical Assessment Review Chairperson is responsible for the following:

1. Designating the Secretary for the Technical Assessment Review.
2. Determining the technical disciplines to be used to accomplish the scope and purpose of the review.
3. Establishing minimum qualifications (e.g., education, experience, and independence) needed by review team members to fulfill technical disciplines to accomplish the scope and purpose of the review.
4. Obtaining suitable documentation of review team members' qualifications for the various technical disciplines.
5. Ensuring that the documentation of the review team members' qualifications meets the needs of the review.
6. Determining the number of reviewers for the Technical Assessment Review Team.
7. Obtaining information for the review from the appropriate Technical Project Officer (TPO) and others, as appropriate.
8. Coordinating the Technical Assessment Review Team, the meeting, and the review process.
9. Issuing the Review Record Memorandum to the responsible WMPO Branch Chief for distribution.
10. Compiling a data package of the Technical Assessment Review.

4.3 SECRETARY

The Secretary documents the Technical Assessment Review Team activities. Specifically, the Secretary records the meeting minutes, collects comments and resolutions, and prepares the Review Record Memorandum (per Section 3.5).



WASTE MANAGEMENT PROJECT OFFICE

QUALITY MANAGEMENT PROCEDURE

N-QA-016
7/87

TECHNICAL ASSESSMENT REVIEW

No. QMP-02-08

Rev. 0

Effective Date 08-Aug-1988

Page 5 of 12

4.4 TECHNICAL ASSESSMENT REVIEW TEAM MEMBERS

It is the responsibility of the review team members to review and provide comments in their technical area, as designated by the Chairperson, and to participate in the evaluation of proposed resolutions.

5.0 PROCEDURE

5.1 INITIATION OF THE TECHNICAL ASSESSMENT REVIEW

The responsible WMPO Branch Chief or designee plans, scopes, and schedules the Technical Assessment Review and designates the Technical Assessment Review Chairperson. The responsible WMPO Branch Chief or designee also issues the Technical Assessment Review Notice to Quality Assurance, Regulatory Compliance, and others, as appropriate.

5.2 TEAM SELECTION

5.2.1 The Technical Assessment Review Chairperson performs the following:

1. Designating the Secretary for the Technical Assessment Review.
2. Determining the technical disciplines to be used to accomplish the scope and purpose of the review.
3. Establishing minimum qualifications (e.g., education, experience, and independence) needed by review team members to fulfill the technical disciplines to accomplish the scope and purpose of the review.
4. Obtaining suitable documentation of review team members' qualifications for the various technical disciplines, as described in Section 5.2.2
5. Ensuring that the documentation of the review team members' qualifications meets the needs of the review, and signing and dating the Technical Assessment Review Team Selection Record(s).
6. Determining the number of reviewers for the Technical Assessment Review Team.
7. Ensuring that assigned Review Team Members are trained to this procedure and other applicable documents.



WASTE MANAGEMENT PROJECT OFFICE

QUALITY MANAGEMENT PROCEDURE

N-QA-01
7/87

Title

TECHNICAL ASSESSMENT REVIEW

No. QMP-02-08

Rev.

Effective Date 08-Aug-1988

Page 6 of 12

5.2.2 The Technical Assessment Review Chairperson requests the following information for each of the review team members: name of the person and a statement that the review team member meets the education, experience, and independence qualifications established for the review. This information is to be provided by the employer of the review team member.

5.2.3 If a review team member's employer is an agency outside of the NWSI Project, the chairperson is responsible for notifying the agency that the documentation verifying the education, experience, and independence of the review team member must be obtained and retained by that agency. This documentation shall be made available for surveillance and audit by the U.S. Nuclear Regulatory Commission or the DOE. In addition, the agency shall be required to notify the WMPO prior to destruction of this verification documentation.

5.3 TECHNICAL ASSESSMENT REVIEW PACKAGE

The Technical Assessment Review Chairperson obtains the information for the review from the appropriate TPO and others, as appropriate.

5.4 TECHNICAL ASSESSMENT REVIEW

5.4.1 The review team members review the material and document their comments on Technical Assessment Review Comment Records. If a review team member has no comment, this is documented on a Technical Assessment Review Comment Record.

5.4.2 The Secretary records meeting minutes, collects comments and resolutions, and prepares the Review Record Memorandum (per Section 3.5). The Technical Assessment Review Chairperson reviews, signs, and dates the Review Record Memorandum.

5.5 RESOLUTION OF TECHNICAL ASSESSMENT REVIEW COMMENTS

5.5.1 The Technical Assessment Review Chairperson obtains resolutions for the Technical Assessment Review comments from the appropriate TPO.

5.5.2 The Technical Assessment Review Chairperson coordinates the team's evaluation of the resolutions obtained in Section 5.5.1. After deciding the appropriateness of the resolutions, such acknowledgment is documented to the appropriate TPO.

5.5.3 Any unresolved comments are referred by the Chairperson to the appropriate TPO for resolution. (The appropriate TPO is the one who has responsibility for the subject of the unresolved comment.)



WASTE MANAGEMENT PROJECT OFFICE

QUALITY MANAGEMENT PROCEDURE

N-QA-016
7/87

TECHNICAL ASSESSMENT REVIEW

No. QMP-02-08 Rev. 0
Effective Date 08-Aug-1988
Page 7 of 12

5.5.4 The Chairperson, upon submittal of a review comment resolution by the appropriate TPO, shall ensure that the resolution is provided to the review team member and the responsible WMPO Branch Chief.

5.5.5 The review team member who had the unresolved comment shall evaluate the provided comment resolution, and either:

1. Sign and date the review comment resolution (according to the Chairperson's instruction) to indicate agreement, and return it to the Chairperson.
2. If a disagreement exists, attempt to achieve an agreement, (via the Chairperson) with the appropriate TPO. If agreement cannot be reached, provide the documented basis for the disagreement to the Chairperson and request assistance from successively higher levels of management.

5.5.6 The Chairperson may complete the Review Record Memorandum with a documented unresolved comment; however, supplements must be provided to the memorandum as the appeals process is pursued, such that a complete record of the comment is retained as a QA record.

5.6 REVIEW RECORD MEMORANDUM

The Technical Assessment Review Chairperson issues the Review Record Memorandum to the responsible WMPO Branch Chief for distribution to the TPO(s) and others, as appropriate.

5.7 CLOSURE OF RESOLUTION

The responsible WMPO Branch Chief or designee shall ensure that the appropriate TPO satisfies and closes out the commitments made in resolutions to the Technical Assessment Review comments.

5.8 TECHNICAL ASSESSMENT REVIEW DOCUMENTATION

The Technical Assessment Review Chairperson shall (1) compile a data package relative to the Technical Assessment Review that consists of the Technical Assessment Review Package and the Review Record Memorandum (including any supplements as described in Section 5.5.6) and (2) provide for disposition of the data package in accordance with Section 8.0.



WASTE MANAGEMENT PROJECT OFFICE

QUALITY MANAGEMENT PROCEDURE

N-QA-01
7/87

Title

TECHNICAL ASSESSMENT REVIEW

No. QMP-02-08

Rev. ()

Effective Date

Page 8 of 12

6.0 REFERENCES

The latest revisions of the following apply:

NWSSI/88-3, NWSSI Project Systems Engineering Management Plan

DOE Order 4700.1, Project Management System

QMP-17-01, QA Records

7.0 FIGURES

At a minimum, the information needs on the forms shown on the following figures shall be satisfied. This may be accomplished by the use of the form itself or a suitable alternate.

Figure 1, Technical Assessment Review Notice

Figure 2, Technical Assessment Review Team Selection Record

Figure 3, Technical Assessment Review Comment Record

Figure 4, Technical Assessment Review Comment Record Continuation Sheet

8.0 QA RECORDS

The following are QA records and are maintained in accordance with QMP-17-01, QA Records.

1. Technical Assessment Review Package.
2. Review Record Memorandum (including any supplements as described in Section 5.5.6).



WASTE MANAGEMENT PROJECT OFFICE
QUALITY MANAGEMENT PROCEDURE

N-QA-016
7/87

TECHNICAL ASSESSMENT REVIEW

No. **QMP-02-08** Rev. **0**
Effective Date **08-Aug-1988**
Page **9** of **12**

| TECHNICAL ASSESSMENT REVIEW NOTICE | | N-QA-010 7/88 |
|---|----------------|------------------|
| To _____ | Date _____ | |
| Technical Area to be Reviewed _____ | | |
| WBS No.: _____ | | |
| Review Date _____ | Location _____ | Time _____ |
| Technical Assessment Review Chairperson _____ | | |
| <p>Based on review of the qualification documentation, this Technical Assessment Review Chairperson is qualified to execute the responsibilities of QMP-02-08 with respect to the scope and purpose of this Review.</p> | | |
| <p>Scope of Technical Assessment Review:</p> | | |
| <p>Purpose of Technical Assessment Review:</p> | | |
| Signed _____ | | |
| Attachments: | | |

Figure 1. Technical Assessment Review Notice.

Figure 2. Technical Assessment Review Team Selection Record.

QUALITY MANAGEMENT PROCEDURE

**N-0A-016
7/87**

TECHNICAL ASSESSMENT REVIEW

No. **QMP-02-08** Rev. **0**

Rev.

Effective Date 08-Aug-1988

Page 11 of 12

| TECHNICAL ASSESSMENT REVIEW COMMENT RECORD | | | | | | | N-QA-006 7/85 | |
|--|--------------------|----------|--------------------|--------|------------|------------------------|----------------------|--|
| Technical Assessment Review Subject _____ | | | | | | | Sheet _____ of _____ | |
| Reviewer _____ | | | Organization _____ | | Date _____ | | | |
| Comments Resolved By _____ | | | Organization _____ | | Date _____ | | | |
| REVIEWER'S COMMENTS | | | RESOLUTION | | | REVIEWER'S DISPOSITION | | |
| Item Number | Reference Doc. No. | Comments | Accept | Reject | Reason | Accept | Reject | |
| | | | | | | | | |

Figure 3. Technical Assessment Review Comment Record.

**5.0 List of Reviewers (By Name, Organization, Discipline, and Comment
Reference Number Summary)**

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|-------------|--------------|---------------------------|--------------|--------------------|-------------|
| SAIC/TARC | Mining | A. LANGSTAFF | MI-001 | T.MI.ALL.001 | FS-GA-0150 | T |
| SAIC/TARC | Ventilation | A. LANGSTAFF | VE-008 | T.VE.ALL.002 | FS-GA-0228 | C-4, C-6 T |
| SAIC/TARC | Ventilation | A. LANGSTAFF | VE-002 | T.VE.ALL.003 | FS-GA-0225 | T |
| SAIC/TARC | General | A. LANGSTAFF | GE-005 | T.GE.ALL.004 | GENERAL | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO M&N | TRANSMITTED TO F&S AND M&N | TOTAL COMMENTS |
|--------------|-----------------------|-----------------------|-------------------------------|-------------------|
| A. LANGSTAFF | 3 | 0 | 1 | 4 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITIC |
|--------------|------------------|-----------|---------------------------|--------------|--------------------|------------|
| NTOS | General | A. VELOSO | GE-039 | E.GE.ARV.001 | GENERAL | T |
| NTOS | General | A. VELOSO | GE-018 | E.GE.ARV.002 | GENERAL | T |
| NTOS | General | A. VELOSO | GE-038 | E.GE.ARV.003 | GENERAL | T |
| NTOS | Piping & Instrum | A. VELOSO | PI-007 | E.PI.ARV.004 | FS-GA-0222 | T |
| NTOS | General | A. VELOSO | GE-002 | E.GE.ARV.005 | GENERAL | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&M | TRANSMITTED TO F&S AND H&M | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| A. VELOSO | 1 | 0 | 4 | 5 |

09/26/88

Page 1

**COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER**

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|-------------|-------------|---------------------------|--------------|--------------------|--------------------------|
| B OF M | Mining | B. CANTRELL | MI-145 | B.MI.BC.001 | FS-SP-1109 | PAGE 1 T |
| B OF M | Mining | B. CANTRELL | MI-146 | B.MI.BC.002 | FS-SP-1109 | PAGE 1 T |
| B OF M | Ventilation | B. CANTRELL | VE-009 | B.VE.BC.003 | FS-GA-0228 | C3, C7 T |
| B OF M | Mining | B. CANTRELL | MI-147 | B.MI.BC.004 | FS-SP-1109 | PAGE 1 T |
| B OF M | Mining | B. CANTRELL | MI-080 | B.MI.BC.005 | FS-SP-0204 | PAGE 2, SECT. 3.1.2 T |
| B OF M | Civil | B. CANTRELL | CI-068 | B.CI.BC.006 | FS-GA-0031 | B3, B4 T |
| B OF M | Mining | B. CANTRELL | MI-116 | B.MI.BC.007 | FS-SP-0205 | PAGE 10, SECT. 3.10 T |
| B OF M | Mining | B. CANTRELL | MI-079 | B.MI.BC.008 | FS-SP-0204 | PAGE 2 T |
| B OF M | Mining | B. CANTRELL | MI-144 | B.MI.BC.009 | FS-SP-1107 | PAGE 3, SECTION 2.1 T |
| B OF M | Civil | B. CANTRELL | CI-007 | B.CI.BC.010 | JS-025-ESF-C3 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|-------------|-----------------------|-----------------------|-------------------------------|-------------------|
| B. CANTRELL | 9 | 1 | 0 | 10 |

09/26/88

Page 1

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|-----------|---------------------------|--------------|-------------------------|-------------|
| NVO/ISD | Electrical | D. BROGAN | EL-049 | 1.EL.DDB.001 | JS-025-ESF-W10 B,E,D8,9 | T |
| NVO/ISD | General | D. BROGAN | GE-013 | 1.GE.DDB.002 | GENERAL H&M | T |
| NVO/ISD | Civil | D. BROGAN | CI-024 | 1.CI.DDB.003 | JS-025-ESF-C6 H6 | T |
| NVO/ISD | Electrical | D. BROGAN | EL-015 | 1.EL.DDB.004 | JS-025-6006-W1 B,D,E7 | T |
| NVO/ISD | Mechanical | D. BROGAN | ME-082 | 1.ME.DDB.005 | JS-025-6008-M1 E9 | T |
| NVO/ISD | Civil | D. BROGAN | CI-148 | 1.CI.DDB.006 | JS-025-ESF-C43 E9 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&M | TRANSMITTED TO F&S AND H&M | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| D. BROGAN | 0 | 6 | 0 | 6 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------------|--------------|---------------------------|--------------|--------------------|------------------|
| NVO/SHD | Shaft | D. MCPHERSON | SH-109 | N.SH.DGM.001 | FS-GA-0100 | SECTION A-A T |
| NVO/SHD | Piping & Instrum | D. MCPHERSON | PI-012 | N.PI.DGM.002 | FS-GA-0222 | T |
| NVO/SHD | Shaft | D. MCPHERSON | SH-117 | N.SH.DGM.003 | FS-GA-0112 | T |
| NVO/SHD | Shaft | D. MCPHERSON | SH-118 | N.SH.DGM.004 | FS-GA-0112 | REV. B T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO N&N | TRANSMITTED TO F&S AND N&N | TOTAL COMMENTS |
|--------------|-----------------------|-----------------------|-------------------------------|-------------------|
| D. MCPHERSON | 4 | 0 | 0 | 4 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------------|-----------|---------------------------|--------------|-------------------------------|-------------|
| LLNL | Electrical | D. WILDER | EL-036 | L.EL.DGW.001 | JS-025-ESF-E5 B | T |
| LLNL | Civil | D. WILDER | CI-003 | L.CI.DGW.002 | FS-GA-0011 | T |
| LLNL | Civil | D. WILDER | CI-014 | L.CI.DGW.003 | JS-025-ESF-C4 B | T |
| LLNL | Civil | D. WILDER | CI-165 | L.CI.DGW.004 | JS-025-ESF-C44 B | T |
| LLNL | Piping & Instrum | D. WILDER | PI-015 | L.PI.DGW.005 | FS-GA-0235 | T |
| LLNL | General | D. WILDER | GE-038 | L.GE.DGW.006 | FS-GA-0006 GENERAL | T |
| LLNL | Electrical | D. WILDER | EL-009 | L.EL.DGW.007 | FS-GA-0202 | T |
| LLNL | Mining | D. WILDER | MI-063 | L.MI.DGW.008 | FS-GA-0166 SECTION B-B | T |
| LLNL | Mining | D. WILDER | MI-022 | L.MI.DGW.009 | FS-GA-0160 MECHANICAL | T |
| LLNL | Mining | D. WILDER | MI-061 | L.MI.DGW.010 | FS-GA-0166 PLAN | T |
| LLNL | Electrical | D. WILDER | EL-012 | L.EL.DGW.011 | FS-GA-0204 | T |
| LLNL | Ventilation | D. WILDER | VE-001 | L.VE.DGW.012 | FS-GA-0225 | T |
| LLNL | Piping & Instrum | D. WILDER | PI-016 | L.PI.DGW.013 | FS-GA-0235 | T |
| LLNL | Piping & Instrum | D. WILDER | PI-017 | L.PI.DGW.014 | FS-GA-0240 | T |
| LLNL | Mechanical | D. WILDER | ME-023 | L.ME.DGW.015 | JS-025-ESF-FP8 B | T |
| LLNL | Electrical | D. WILDER | EL-005 | L.EL.DGW.016 | FS-GA-0201 | T |
| LLNL | Mining | D. WILDER | MI-065 | L.MI.DGW.017 | FS-GA-0166 SECTION B-B | T |
| LLNL | Mining | D. WILDER | MI-138 | L.MI.DGW.018 | FS-SP-0303 & 0304, 0307, 0308 | T |
| LLNL | General | D. WILDER | GE-012 | L.GE.DGW.019 | GENERAL | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| D. WILDER | 14 | 4 | 1 | 19 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------------|----------|---------------------------|--------------|--|-------------|
| REECO | Civil | D. KOSS | CI-031 | R.CI.DLK.001 | JS-025-ESF-C14 B | T |
| REECO | Civil | D. KOSS | CI-032 | R.CI.DLK.002 | JS-025-ESF-C14 B | T |
| REECO | Civil | D. KOSS | CI-008 | R.CI.DLK.003 | JS-025-ESF-C3 B | T |
| REECO | Civil | D. KOSS | CI-005 | R.CI.DLK.004 | JS-025-ESF-C3 B | T |
| REECO | Civil | D. KOSS | CI-139 | R.CI.DLK.005 | JS-025-ESF-C42 B | T |
| REECO | Civil | D. KOSS | CI-045 | R.CI.DLK.006 | JS-025-ESF-C19 B | T |
| REECO | Civil | D. KOSS | CI-098 | R.CI.DLK.007 | JS-025-ESF-C38 B | T |
| REECO | Mechanical | D. KOSS | ME-016 | R.ME.DLK.008 | JS-025-ESF-FP5 B | T |
| REECO | Piping & Instrum | D. KOSS | PI-010 | R.PI.DLK.009 | FS-GA-0222 B | T |
| REECO | Electrical | D. KOSS | EL-062 | R.EL.DLK.010 | JS-025-ESF-W7 B, W8.B | T |
| REECO | Electrical | D. KOSS | EL-061 | R.EL.DLK.011 | JS-025-ESF-W6 B, AND W17.B | T |
| REECO | Architectural | D. KOSS | AR-028 | R.AR.DLK.012 | JS-025-6002-A1 A, A2.A | T |
| REECO | Mechanical | D. KOSS | ME-057 | R.ME.DLK.013 | JS-025-6002-M4 B, FP1.B, E3.B, W1.B | T |
| REECO | Shaft | D. KOSS | SH-037 | R.SH.DLK.014 | FS-GA-0057 | T |
| REECO | General | D. KOSS | GE-021 | R.GE.DLK.015 | GENERAL F&S | T |
| REECO | General | D. KOSS | GE-022 | R.GE.DLK.016 | GENERAL F&S | T |
| REECO | General | D. KOSS | GE-019 | R.GE.DLK.017 | GENERAL F&S | T |
| REECO | Civil | D. KOSS | CI-013 | R.CI.DLK.018 | JS-025-ESF-C4 B | T |
| REECO | Civil | D. KOSS | CI-033 | R.CI.DLK.019 | JS-025-ESF-C14 B | T |
| REECO | Architectural | D. KOSS | AR-040 | R.AR.DLK.020 | JS-025-6008-A1 A | T |
| REECO | Architectural | D. KOSS | AR-005 | R.AR.DLK.021 | JS-025-6000-A1 B, M4.B-M7.B, FP1.B-FP2.B, E2.B, W1.B | T |
| REECO | Shaft | D. KOSS | SH-032 | R.SH.DLK.022 | FS-GA-0056 | T |
| REECO | Civil | D. KOSS | CI-080 | R.CI.DLK.023 | JS-025-ESF-C36 B | T |
| REECO | Shaft | D. KOSS | SH-126 | R.SH.DLK.024 | FS-GA-0113 0062, 0095, 0102 | T |
| REECO | General | D. KOSS | GE-018 | R.GE.DLK.025 | GENERAL F&S | T |
| REECO | General | D. KOSS | GE-020 | R.GE.DLK.026 | GENERAL F&S | T |
| REECO | General | D. KOSS | GE-017 | R.GE.DLK.027 | GENERAL F&S | T |
| REECO | Piping & Instrum | D. KOSS | PI-003 | R.PI.DLK.028 | FS-GA-0220 B | T |
| REECO | Piping & Instrum | D. KOSS | PI-006 | R.PI.DLK.029 | FS-GA-0221 B | T |
| REECO | Shaft | D. KOSS | SH-038 | R.SH.DLK.030 | FS-GA-0057 | T |
| REECO | Shaft | D. KOSS | SH-104 | R.SH.DLK.031 | FS-GA-0095 C6, FS-GA-0150 A4, A5 | T |
| REECO | Shaft | D. KOSS | SH-019 | R.SH.DLK.032 | FS-GA-0050 FS-GA-0100 | T |
| REECO | General | D. KOSS | GE-006 | R.GE.DLK.033 | GENERAL | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| D. KOSS | 15 | 17 | 1 | 33 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|-----------|---------------------------|--------------|---------------------------|-------------|
| COE | Civil | D. POTTER | CI-001 | C.CI.DLP.001 | JS-025-ESF-C1 A - C10 | T |
| COE | Civil | D. POTTER | CI-004 | C.CI.DLP.002 | JS-025-ESF-C2 B | T |
| COE | Civil | D. POTTER | CI-017 | C.CI.DLP.003 | JS-025-ESF-C4 B | T |
| COE | Civil | D. POTTER | CI-018 | C.CI.DLP.004 | JS-025-ESF-C4 B | T |
| COE | Civil | D. POTTER | CI-019 | C.CI.DLP.005 | JS-025-ESF-C4 B | T |
| COE | Civil | D. POTTER | CI-020 | C.CI.DLP.006 | JS-025-ESF-C4 B | T |
| COE | Civil | D. POTTER | CI-021 | C.CI.DLP.007 | JS-025-ESF-C4 B | T |
| COE | Civil | D. POTTER | CI-022 | C.CI.DLP.008 | JS-025-ESF-C4 B | T |
| COE | Civil | D. POTTER | CI-025 | C.CI.DLP.009 | JS-025-ESF-C6 B | T |
| COE | Civil | D. POTTER | CI-027 | C.CI.DLP.010 | JS-025-ESF-C11 B | T |
| COE | Civil | D. POTTER | CI-028 | C.CI.DLP.011 | JS-025-ESF-C11 B | T |
| COE | Civil | D. POTTER | CI-030 | C.CI.DLP.012 | JS-025-ESF-C11 B. ZONE G7 | T |
| COE | Civil | D. POTTER | CI-029 | C.CI.DLP.013 | JS-025-ESF-C11 B | T |
| COE | Civil | D. POTTER | CI-034 | C.CI.DLP.014 | JS-025-ESF-C16 B | T |
| COE | Civil | D. POTTER | CI-038 | C.CI.DLP.015 | JS-025-ESF-C18 B | T |
| COE | Civil | D. POTTER | CI-039 | C.CI.DLP.016 | JS-025-ESF-C18 B | T |
| COE | Civil | D. POTTER | CI-040 | C.CI.DLP.017 | JS-025-ESF-C18 B | T |
| COE | Civil | D. POTTER | CI-041 | C.CI.DLP.018 | JS-025-ESF-C18 B | T |
| COE | Civil | D. POTTER | CI-042 | C.CI.DLP.019 | JS-025-ESF-C18 B | T |
| COE | Civil | D. POTTER | CI-043 | C.CI.DLP.020 | JS-025-ESF-C18 B | T |
| COE | Civil | D. POTTER | CI-044 | C.CI.DLP.021 | JS-025-ESF-C18 B | T |
| COE | Civil | D. POTTER | CI-046 | C.CI.DLP.022 | JS-025-ESF-C19 B | T |
| COE | Civil | D. POTTER | CI-047 | C.CI.DLP.023 | JS-025-ESF-C19 B | T |
| COE | Civil | D. POTTER | CI-049 | C.CI.DLP.024 | JS-025-ESF-C19 B | T |
| COE | Civil | D. POTTER | CI-050 | C.CI.DLP.025 | JS-025-ESF-C19 B | T |
| COE | Civil | D. POTTER | CI-051 | C.CI.DLP.026 | JS-025-ESF-C19 B | T |
| COE | Civil | D. POTTER | CI-052 | C.CI.DLP.027 | JS-025-ESF-C19 B | T |
| COE | Civil | D. POTTER | CI-054 | C.CI.DLP.028 | JS-025-ESF-C19 B | T |
| COE | Civil | D. POTTER | CI-053 | C.CI.DLP.029 | JS-025-ESF-C19 B | T |
| COE | Civil | D. POTTER | CI-048 | C.CI.DLP.030 | JS-025-ESF-C19 B | T |
| COE | Civil | D. POTTER | CI-057 | C.CI.DLP.031 | JS-025-ESF-C20 B | T |
| COE | Civil | D. POTTER | CI-056 | C.CI.DLP.032 | JS-025-ESF-C20 B | T |
| COE | Civil | D. POTTER | CI-055 | C.CI.DLP.033 | JS-025-ESF-C20 B | T |
| COE | Civil | D. POTTER | CI-065 | C.CI.DLP.034 | JS-025-ESF-C24 B | T |
| COE | Civil | D. POTTER | CI-064 | C.CI.DLP.035 | JS-025-ESF-C24 B | T |
| COE | Civil | D. POTTER | CI-063 | C.CI.DLP.036 | JS-025-ESF-C24 B | T |
| COE | Civil | D. POTTER | CI-062 | C.CI.DLP.037 | JS-025-ESF-C24 B | T |
| COE | Civil | D. POTTER | CI-061 | C.CI.DLP.038 | JS-025-ESF-C24 B | T |
| COE | Civil | D. POTTER | CI-060 | C.CI.DLP.039 | JS-025-ESF-C24 B | T |
| COE | Civil | D. POTTER | CI-059 | C.CI.DLP.040 | JS-025-ESF-C24 B | T |
| COE | Civil | D. POTTER | CI-068 | C.CI.DLP.041 | JS-025-ESF-C26 B | T |
| COE | Civil | D. POTTER | CI-069 | C.CI.DLP.042 | JS-025-ESF-C26 B | T |
| COE | Civil | D. POTTER | CI-070 | C.CI.DLP.043 | JS-025-ESF-C26 B | T |
| COE | Civil | D. POTTER | CI-071 | C.CI.DLP.044 | JS-025-ESF-C26 B | T |
| COE | Civil | D. POTTER | CI-072 | C.CI.DLP.045 | JS-025-ESF-C27 B | T |
| COE | Civil | D. POTTER | CI-074 | C.CI.DLP.046 | JS-025-ESF-C27 B | T |
| COE | Civil | D. POTTER | CI-073 | C.CI.DLP.047 | JS-025-ESF-C27 B | T |
| COE | Civil | D. POTTER | CI-076 | C.CI.DLP.048 | JS-025-ESF-C28 B | T |
| COE | Civil | D. POTTER | CI-075 | C.CI.DLP.049 | JS-025-ESF-C28 B | T |
| COE | Civil | D. POTTER | CI-081 | C.CI.DLP.050 | JS-025-ESF-C36 B | T |
| COE | Civil | D. POTTER | CI-091 | C.CI.DLP.051 | JS-025-ESF-C37 B | T |
| COE | Civil | D. POTTER | CI-082 | C.CI.DLP.052 | JS-025-ESF-C37 B | T |
| COE | Civil | D. POTTER | CI-094 | C.CI.DLP.053 | JS-025-ESF-C37 B | T |

| | | | | | | | |
|-----|---------|-----------|--------|--------------|----------------|---------------|---|
| COE | Civil | D. POTTER | CI-095 | C.CI.DLP.054 | JS-025-ESF-C37 | B | T |
| COE | Civil | D. POTTER | CI-088 | C.CI.DLP.055 | JS-025-ESF-C37 | B | T |
| COE | Civil | D. POTTER | CI-089 | C.CI.DLP.056 | JS-025-ESF-C37 | B | T |
| JE | Civil | D. POTTER | CI-092 | C.CI.DLP.057 | JS-025-ESF-C37 | B | T |
| COE | Civil | D. POTTER | CI-096 | C.CI.DLP.058 | JS-025-ESF-C37 | B | T |
| COE | Civil | D. POTTER | CI-090 | C.CI.DLP.059 | JS-025-ESF-C37 | B | T |
| COE | Civil | D. POTTER | CI-093 | C.CI.DLP.060 | JS-025-ESF-C37 | B | T |
| COE | Civil | D. POTTER | CI-099 | C.CI.DLP.061 | JS-025-ESF-C38 | B | T |
| COE | Civil | D. POTTER | CI-100 | C.CI.DLP.062 | JS-025-ESF-C38 | B | T |
| COE | Civil | D. POTTER | CI-102 | C.CI.DLP.063 | JS-025-ESF-C39 | B | T |
| COE | Civil | D. POTTER | CI-101 | C.CI.DLP.064 | JS-025-ESF-C39 | 13 | T |
| COE | Civil | D. POTTER | CI-104 | C.CI.DLP.065 | JS-025-ESF-C39 | B | T |
| COE | Civil | D. POTTER | CI-105 | C.CI.DLP.066 | JS-025-ESF-C39 | B | T |
| COE | Civil | D. POTTER | CI-106 | C.CI.DLP.067 | JS-025-ESF-C39 | B | T |
| COE | Civil | D. POTTER | CI-108 | C.CI.DLP.068 | JS-025-ESF-C39 | B | T |
| COE | Civil | D. POTTER | CI-107 | C.CI.DLP.069 | JS-025-ESF-C39 | B | T |
| COE | Civil | D. POTTER | CI-113 | C.CI.DLP.070 | JS-025-ESF-C40 | B | T |
| COE | Civil | D. POTTER | CI-114 | C.CI.DLP.071 | JS-025-ESF-C40 | B | T |
| COE | Civil | D. POTTER | CI-121 | C.CI.DLP.072 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-124 | C.CI.DLP.073 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-125 | C.CI.DLP.074 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-126 | C.CI.DLP.075 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-136 | C.CI.DLP.076 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-127 | C.CI.DLP.077 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-128 | C.CI.DLP.078 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-129 | C.CI.DLP.079 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-130 | C.CI.DLP.080 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-131 | C.CI.DLP.081 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-132 | C.CI.DLP.082 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-133 | C.CI.DLP.083 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-134 | C.CI.DLP.084 | JS-025-ESF-C41 | B | T |
| JE | Civil | D. POTTER | CI-135 | C.CI.DLP.085 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-123 | C.CI.DLP.086 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-122 | C.CI.DLP.087 | JS-025-ESF-C41 | B | T |
| COE | Civil | D. POTTER | CI-137 | C.CI.DLP.088 | JS-025-ESF-C42 | B | T |
| COE | Civil | D. POTTER | CI-138 | C.CI.DLP.089 | JS-025-ESF-C42 | B | T |
| COE | Civil | D. POTTER | CI-140 | C.CI.DLP.090 | JS-025-ESF-C42 | B | T |
| COE | Civil | D. POTTER | CI-141 | C.CI.DLP.091 | JS-025-ESF-C42 | B | T |
| COE | Civil | D. POTTER | CI-143 | C.CI.DLP.092 | JS-025-ESF-C43 | B | T |
| COE | Civil | D. POTTER | CI-144 | C.CI.DLP.093 | JS-025-ESF-C43 | B | T |
| COE | Civil | D. POTTER | CI-145 | C.CI.DLP.094 | JS-025-ESF-C43 | B | T |
| COE | Civil | D. POTTER | CI-146 | C.CI.DLP.095 | JS-025-ESF-C43 | B | T |
| COE | Civil | D. POTTER | CI-147 | C.CI.DLP.096 | JS-025-ESF-C43 | B | T |
| COE | Civil | D. POTTER | CI-157 | C.CI.DLP.097 | JS-025-ESF-C44 | B | T |
| COE | Civil | D. POTTER | CI-158 | C.CI.DLP.098 | JS-025-ESF-C44 | B | T |
| COE | Civil | D. POTTER | CI-159 | C.CI.DLP.099 | JS-025-ESF-C44 | B | T |
| COE | Civil | D. POTTER | CI-160 | C.CI.DLP.100 | JS-025-ESF-C44 | B | T |
| COE | Civil | D. POTTER | CI-161 | C.CI.DLP.101 | JS-025-ESF-C44 | B | T |
| COE | Civil | D. POTTER | CI-162 | C.CI.DLP.102 | JS-025-ESF-C44 | B | T |
| COE | Civil | D. POTTER | CI-163 | C.CI.DLP.103 | JS-025-ESF-C44 | B | T |
| COE | Civil | D. POTTER | CI-164 | C.CI.DLP.104 | JS-025-ESF-C44 | B | T |
| COE | Civil | D. POTTER | CI-083 | C.CI.DLP.105 | JS-025-ESF-C37 | B | T |
| COE | General | D. POTTER | GE-042 | C.GE.DLP.106 | GENERAL M&N | SPECIFICATION | T |
| COE | General | D. POTTER | GE-043 | C.GE.DLP.107 | GENERAL M&N | SPECIFICATION | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO M&N | TRANSMITTED TO F&S AND M&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| POTTER | 0 | 107 | 0 | 107 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITIC |
|--------------|------------|---------------|---------------------------|--------------|--------------------|-------------------|
| SAIC/TARC | Shaft | D. ROSS-BROWN | SH-090 | T.SH.DMR.001 | FS-GA-0072 | SECTION D-D T |
| SAIC/TARC | Shaft | D. ROSS-BROWN | SH-056 | T.SH.DMR.002 | FS-GA-0059 | ZONES C3 AND B3 T |
| SAIC/TARC | Mining | D. ROSS-BROWN | MI-060 | T.MI.DMR.003 | FS-GA-0166 | ZONE C3 T |
| SAIC/TARC | Shaft | D. ROSS-BROWN | SH-055 | T.SH.DMR.004 | FS-GA-0059 | ZONE D6 T |
| SAIC/TARC | Shaft | D. ROSS-BROWN | SH-053 | T.SH.DMR.005 | FS-GA-0059 | ZONE A8 T |
| SAIC/TARC | Mining | D. ROSS-BROWN | MI-047 | T.MI.DMR.006 | FS-GA-0163 | ZONES A7 AND A5 T |
| SAIC/TARC | Mining | D. ROSS-BROWN | MI-041 | T.MI.DMR.007 | FS-GA-0163 | ZONE C5 T |
| SAIC/TARC | Mining | D. ROSS-BROWN | MI-051 | T.MI.DMR.008 | FS-GA-0164 | ZONE D6 T |
| SAIC/TARC | Mining | D. ROSS-BROWN | MI-007 | T.MI.DMR.009 | FS-GA-0151 | AND FS-GA-0164 T |
| SAIC/TARC | Mining | D. ROSS-BROWN | MI-009 | T.MI.DMR.010 | FS-GA-0151 | ZONE D5 T |
| SAIC/TARC | Mining | D. ROSS-BROWN | MI-010 | T.MI.DMR.011 | FS-GA-0151 | ZONES A6, B6 T |
| SAIC/TARC | Shaft | D. ROSS-BROWN | SH-035 | T.SH.DMR.012 | FS-GA-0056 | TEST MONITORING T |
| | | | | | | SECTION |
| SAIC/TARC | Shaft | D. ROSS-BROWN | SH-093 | T.SH.DMR.013 | FS-GA-0085 | FS-GA-0091 T |
| SAIC/TARC | Mining | D. ROSS-BROWN | MI-023 | T.MI.DMR.014 | FS-GA-0160 | ZONE B3 T |
| SAIC/TARC | Mining | D. ROSS-BROWN | MI-039 | T.MI.DMR.015 | FS-GA-0162 | ZONE A4 T |
| SAIC/TARC | Mining | D. ROSS-BROWN | MI-054 | T.MI.DMR.016 | FS-GA-0165 | ZONE A4 T |
| SAIC/TARC | General | D. ROSS-BROWN | GE-028 | T.GE.DMR.017 | FS-GA-0003 | SYMBOLS T |
| SAIC/TARC | Shaft | D. ROSS-BROWN | SH-128 | T.SH.DMR.018 | FS-GA-0113 | ZONE C7 T |
| SAIC/TARC | Shaft | D. ROSS-BROWN | SH-155 | T.SH.DMR.019 | FS-SP-0503 | PAGE 3 T |
| SAIC/TARC | Shaft | D. ROSS-BROWN | SH-158 | T.SH.DMR.020 | FS-SP-1409 | THROUGH 1414 T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|---------------|-----------------------|-----------------------|-------------------------------|-------------------|
| D. ROSS-BROWN | 20 | 0 | 0 | 20 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|------------|---------------------------|--------------|--------------------|-------------|
| B OF M | Mining | D. Dolinar | MI-130 | B.MI.DRD.001 | FS-SP-0208 | PAGE 2 T |
| B OF M | Mining | D. Dolinar | MI-133 | B.MI.DRD.002 | FS-SP-0208 | PAGE 1 T |
| B OF M | Mining | D. Dolinar | MI-131 | B.MI.DRD.003 | FS-SP-0208 | PAGE 2 T |
| B OF M | Mining | D. Dolinar | MI-132 | B.MI.DRD.004 | FS-SP-0208 | PAGE 2 T |
| B OF M | Mining | D. Dolinar | MI-126 | B.MI.DRD.005 | FS-SP-0208 | T |
| B OF M | Mining | D. Dolinar | MI-134 | B.MI.DRD.006 | FS-SP-0208 | PAGE 3 T |
| B OF M | Mining | D. Dolinar | MI-135 | B.MI.DRD.007 | FS-SP-0208 | PAGE 3 T |
| B OF M | Mining | D. Dolinar | MI-127 | B.MI.DRD.008 | FS-SP-0208 | T |
| B OF M | Mining | D. Dolinar | MI-035 | B.MI.DRD.009 | FS-GA-0162 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-------------------------------|-------------------|
| D. Dolinar | 9 | 0 | 0 | 9 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|---------------|----------|---------------------------|--------------|------------------------------|-------------|
| WESTON | Electrical | D. WAGG | EL-045 | K.EL.DW.001 | JS-025-ESF-E7 A | T |
| WESTON | Architectural | D. WAGG | AR-041 | K.AR.DW.002 | JS-025-6008-A1 A | T |
| WESTON | Architectural | D. WAGG | AR-042 | K.AR.DW.003 | JS-025-6008-A1 A | T |
| WESTON | Architectural | D. WAGG | AR-013 | K.AR.DW.004 | JS-025-6001-A2 A | T |
| WESTON | Architectural | D. WAGG | AR-021 | K.AR.DW.005 | JS-025-6001-A3 A | T |
| WESTON | Civil | D. WAGG | CI-064 | K.CI.DW.006 | FS-GA-0031 | T |
| WESTON | Civil | D. WAGG | CI-018 | K.CI.DW.007 | FS-GA-0013 | T |
| WESTON | Civil | D. WAGG | CI-024 | K.CI.DW.008 | FS-GA-0015 | T |
| WESTON | Civil | D. WAGG | CI-025 | K.CI.DW.009 | FS-GA-0013 | T |
| WESTON | Shaft | D. WAGG | SH-012 | K.SH.DW.010 | FS-GA-0050 B 5, C AND D 5 | T |
| WESTON | Shaft | D. WAGG | SH-015 | K.SH.DW.011 | FS-GA-0050 D4 | T |
| WESTON | Shaft | D. WAGG | SH-034 | K.SH.DW.012 | FS-GA-0056 A4 - A5 | T |
| WESTON | Shaft | D. WAGG | SH-121 | K.SH.DW.013 | FS-GA-0113 B1, B2, C1, C2 | T |
| WESTON | Mining | D. WAGG | MI-071 | K.MI.DW.014 | FS-GA-0180 B, C, D - 3 AND 4 | T |
| WESTON | General | D. WAGG | GE-023 | K.GE.DW.015 | GENERAL | T |
| WESTON | Mining | D. WAGG | MI-048 | K.MI.DW.016 | FS-GA-0164 | T |
| WESTON | Shaft | D. WAGG | SH-025 | K.SH.DW.017 | FS-GA-0054 | T |
| WESTON | Civil | D. WAGG | CI-043 | K.CI.DW.018 | FS-GA-0025 B, C-3 | T |
| WESTON | Shaft | D. WAGG | SH-073 | K.SH.DW.019 | FS-GA-0063 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| D. WAGG | 13 | 5 | 1 | 19 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|------------|---------------------------|--------------|-----------------------------------|-------------|
| SAIC/TARC | General | E. CIKANEK | GE-009 | T.GE.EMC.001 | GENERAL H&N | T |
| SAIC/TARC | General | E. CIKANEK | GE-029 | T.GE.EMC.002 | FS-GA-0003 D2 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-016 | T.MI.EMC.003 | FS-GA-0160 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-059 | T.MI.EMC.004 | FS-GA-0166 A4, B4, C3 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-072 | T.MI.EMC.005 | FS-GA-0180 D5 | T |
| SAIC/TARC | General | E. CIKANEK | GE-017 | T.GE.EMC.006 | GENERAL | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-003 | T.CI.EMC.007 | JS-025-ESF-C2 | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-010 | T.CI.EMC.008 | JS-025-ESF-C3 E10 | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-011 | T.CI.EMC.009 | JS-025-ESF-C3 F10 | T |
| SAIC/TARC | Electrical | E. CIKANEK | EL-046 | T.EL.EMC.010 | JS-025-ESF-E7 C7 | T |
| SAIC/TARC | General | E. CIKANEK | GE-030 | T.GE.EMC.011 | FS-GA-0003 D0 | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-023 | T.CI.EMC.012 | JS-025-ESF-C6 H6 | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-009 | T.CI.EMC.013 | FS-GA-0011 D4 | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-030 | T.SH.EMC.014 | FS-GA-0055 A5 | T |
| SAIC/TARC | General | E. CIKANEK | GE-025 | T.GE.EMC.015 | GENERAL F&S DRAWINGS | T |
| SAIC/TARC | General | E. CIKANEK | GE-008 | T.GE.EMC.016 | GENERAL H&N DRAWINGS | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-051 | T.SH.EMC.017 | FS-GA-0059 C3-4 | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-069 | T.SH.EMC.018 | FS-GA-0062 SECTION A-A & DETAIL 3 | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-065 | T.SH.EMC.019 | FS-GA-0062 DETAILS 1 & 3 | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-017 | T.SH.EMC.020 | FS-GA-0050 D7 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-008 | T.MI.EMC.021 | FS-GA-0151 UDBR PLAN | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-052 | T.MI.EMC.022 | FS-GA-0165 B6 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-053 | T.MI.EMC.023 | FS-GA-0165 C7 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-064 | T.MI.EMC.024 | FS-GA-0166 SECTIONS A-A & B-B | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-075 | T.MI.EMC.025 | FS-GA-0194 A5, A6 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-074 | T.MI.EMC.026 | FS-GA-0194 | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-130 | T.SH.EMC.027 | FS-SP-0201 PAGE 1, SECTION 1.2.1 | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-133 | T.SH.EMC.028 | FS-SP-0201 PAGE 2, SECTION 2.2 | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-138 | T.SH.EMC.029 | FS-SP-0202 PAGE 1, SECTION 1.1 | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-140 | T.SH.EMC.030 | FS-SP-0202 PAGE 3, PART 2 | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-144 | T.SH.EMC.031 | FS-SP-0203 PAGE 1, SECTION 1.1 | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-152 | T.SH.EMC.032 | FS-SP-0308 PAGE 1, SECTION 1.2.1 | T |
| SAIC/TARC | Shaft | E. CIKANEK | SH-154 | T.SH.EMC.033 | FS-SP-0308 PAGE 5, SECTION 3.8 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-085 | T.MI.EMC.034 | FS-SP-0204 PAGE 6 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-114 | T.MI.EMC.035 | FS-SP-0205 PAGE 9, SECTION 3.6 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-129 | T.MI.EMC.036 | FS-SP-0208 PAGE 1, SECTION 1.2.4 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-139 | T.MI.EMC.037 | FS-SP-0303 PAGE 5, SECTION 3.8 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-140 | T.MI.EMC.038 | FS-SP-0304 PAGE 1, SECTION 1.1 | T |
| SAIC/TARC | Mining | E. CIKANEK | MI-142 | T.MI.EMC.039 | FS-SP-1105 PAGE 3, PART 3 | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-193 | T.CI.EMC.040 | SECTION 02222 PAGE 4, H4 | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-181 | T.CI.EMC.041 | SECTION 02211 PAGE 3, PART 3 | T |

| | | | | | | | |
|-----------|-------|------------|--------|--------------|---------------|---------------|---|
| SAIC/TARC | Civil | E. CIKANEK | CI-188 | T.CI.EMC.042 | SECTION 02211 | PAGE 3, 3.038 | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-189 | T.CI.EMC.043 | SECTION 02222 | PAGE 3, 2.018 | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-195 | T.CI.EMC.044 | SECTION 02223 | PAGE 1 | T |
| AIC/TARC | Civil | E. CIKANEK | CI-196 | T.CI.EMC.045 | SECTION 02223 | PAGE 2, 1.02 | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-202 | T.CI.EMC.046 | SECTION 02223 | PAGE 5, 3.06 | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-203 | T.CI.EMC.047 | SECTION 02225 | PAGE 2, 1.02 | T |
| SAIC/TARC | Civil | E. CIKANEK | CI-212 | T.CI.EMC.048 | SECTION 02611 | PAGE 2, 1.02 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&M | TRANSMITTED TO F&S AND H&M | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-------------------------------|-------------------|
| E. CIKANEK | 31 | 16 | 1 | 48 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|---------------|-----------|---------------------------|--------------|-------------------------------------|-------------|
| COE | Mechanical | E. JENSEN | ME-041 | C.ME.EOJ.001 | JS-025-6000-M6 B | T |
| COE | Mechanical | E. JENSEN | ME-042 | C.ME.EOJ.002 | JS-025-6000-M6 B | T |
| COE | Mechanical | E. JENSEN | ME-049 | C.ME.EOJ.003 | JS-025-6000-FP2 B | T |
| COE | Mechanical | E. JENSEN | ME-051 | C.ME.EOJ.004 | JS-025-6001-M2 B | T |
| COE | Mechanical | E. JENSEN | ME-052 | C.ME.EOJ.005 | JS-025-6001-FP2 B | T |
| COE | Mechanical | E. JENSEN | ME-056 | C.ME.EOJ.006 | JS-025-6002-M4 B | T |
| COE | Mechanical | E. JENSEN | ME-055 | C.ME.EOJ.007 | JS-025-6002-M4 B | T |
| COE | Architectural | E. JENSEN | AR-027 | C.AR.EOJ.008 | JS-025-6002-A1 A | T |
| COE | Architectural | E. JENSEN | AR-035 | C.AR.EOJ.009 | JS-025-6006-A1 B | T |
| COE | Mechanical | E. JENSEN | ME-064 | C.ME.EOJ.010 | JS-025-6006-M1 B | T |
| COE | Mechanical | E. JENSEN | ME-063 | C.ME.EOJ.011 | JS-025-6006-M1 B | T |
| COE | Mechanical | E. JENSEN | ME-065 | C.ME.EOJ.012 | JS-025-6006-M2 B | T |
| COE | Mechanical | E. JENSEN | ME-066 | C.ME.EOJ.013 | JS-025-6006-M2 B | T |
| COE | Mechanical | E. JENSEN | ME-072 | C.ME.EOJ.014 | JS-025-6006-FP1 B | T |
| COE | Mechanical | E. JENSEN | ME-079 | C.ME.EOJ.015 | JS-025-6007-M1 B | T |
| COE | Mechanical | E. JENSEN | ME-080 | C.ME.EOJ.016 | JS-025-6007-M1 B | T |
| COE | Architectural | E. JENSEN | AR-048 | C.AR.EOJ.017 | JS-025-6008-A1 A | T |
| COE | Mechanical | E. JENSEN | ME-081 | C.ME.EOJ.018 | JS-025-6008-M1 B | T |
| COE | Mechanical | E. JENSEN | ME-083 | C.ME.EOJ.019 | JS-025-6008-M2 B | T |
| COE | Mechanical | E. JENSEN | ME-086 | C.ME.EOJ.020 | JS-025-6008-FP1 B | T |
| COE | Electrical | E. JENSEN | EL-019 | C.EL.EOJ.021 | JS-025-6008-E1 B | T |
| COE | Architectural | E. JENSEN | AR-003 | C.AR.EOJ.022 | JS-025-ESF-A1 A | T |
| E | Mechanical | E. JENSEN | ME-088 | C.ME.EOJ.023 | JS-025-058-1-M1 B | T |
| COE | Mechanical | E. JENSEN | ME-092 | C.ME.EOJ.024 | JS-025-058-2-M1 B | T |
| COE | General | E. JENSEN | GE-049 | C.GE.EOJ.025 | GENERAL FP CALCULATIONS | T |
| COE | General | E. JENSEN | GE-050 | C.GE.EOJ.026 | GENERAL FP CALCULATIONS | T |
| COE | General | E. JENSEN | GE-044 | C.GE.EOJ.027 | GENERAL CALCULATIONS | T |
| COE | General | E. JENSEN | GE-048 | C.GE.EOJ.028 | GENERAL COOLING LOAD CALCULATIONS | T |
| COE | General | E. JENSEN | GE-045 | C.GE.EOJ.029 | GENERAL PLUMBING CALCULATIONS M-000 | T |
| COE | General | E. JENSEN | GE-047 | C.GE.EOJ.030 | GENERAL CALCULATIONS M-0003 | T |
| COE | General | E. JENSEN | GE-046 | C.GE.EOJ.031 | GENERAL CALCULATIONS M-0001 | T |
| COE | General | E. JENSEN | GE-043 | C.GE.EOJ.032 | GENERAL DIVISION 15 SPECIFICATIONS | T |
| COE | General | E. JENSEN | GE-007 | C.GE.EOJ.033 | GENERAL | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| E. JENSEN | 0 | 24 | 9 | 33 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------------|-----------|---------------------------|--------------|--------------------|--------------------------------------|
| REECO | Mechanical | F. SPENIA | ME-067 | R.ME.FAS.001 | JS-025-6006-M2 B | T |
| REECO | Mechanical | F. SPENIA | ME-040 | R.ME.FAS.002 | JS-025-6000-M6 B | T |
| REECO | Architectural | F. SPENIA | AR-039 | R.AR.FAS.003 | JS-025-6008-A1 A | T |
| REECO | Piping & Instrum | F. SPENIA | PI-022 | R.PI.FAS.004 | FS-GA-0243 | T |
| REECO | Shaft | F. SPENIA | SH-079 | R.SH.FAS.005 | FS-GA-0072 | T |
| REECO | Civil | F. SPENIA | CI-029 | R.CI.FAS.006 | FS-GA-0015 | 0031, 0033 T |
| REECO | Shaft | F. SPENIA | SH-083 | R.SH.FAS.007 | FS-GA-0072 | T |
| REECO | Civil | F. SPENIA | CI-066 | R.CI.FAS.008 | FS-GA-0031 | 0013 T |
| REECO | Piping & Instrum | F. SPENIA | PI-018 | R.PI.FAS.009 | FS-GA-0240 | T |
| REECO | Shaft | F. SPENIA | SH-003 | R.SH.FAS.010 | FS-GA-0050 | T |
| REECO | Shaft | F. SPENIA | SH-092 | R.SH.FAS.011 | FS-GA-0085 | T |
| REECO | Architectural | F. SPENIA | AR-022 | R.AR.FAS.012 | JS-025-6001-A3 A | T |
| REECO | Civil | F. SPENIA | CI-014 | R.CI.FAS.013 | FS-GA-0012 | 0013, 0014, 0030, 0031, 0033 T |
| REECO | Civil | F. SPENIA | CI-016 | R.CI.FAS.014 | FS-GA-0013 | T |
| REECO | Civil | F. SPENIA | CI-060 | R.CI.FAS.015 | FS-GA-0030 | T |
| REECO | Civil | F. SPENIA | CI-020 | R.CI.FAS.016 | FS-GA-0014 | T |
| REECO | Civil | F. SPENIA | CI-063 | R.CI.FAS.017 | FS-GA-0031 | T |
| REECO | Civil | F. SPENIA | CI-069 | R.CI.FAS.018 | FS-GA-0033 | T |
| REECO | Civil | F. SPENIA | CI-071 | R.CI.FAS.019 | FS-GA-0034 | T |
| REECO | Mining | F. SPENIA | MI-070 | R.MI.FAS.020 | FS-GA-0180 | T |
| ECO | Electrical | F. SPENIA | EL-018 | R.EL.FAS.021 | FS-GA-0212 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| F. SPENIA | 17 | 4 | 0 | 21 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------------|-----------|---------------------------|--------------|---|-------------|
| SAIC/TARC | Mechanical | I. COTTLE | ME-017 | T.ME.IRC.001 | JS-025-ESF-FP5 B - 11G | T |
| SAIC/TARC | Piping & Instrum | I. COTTLE | PI-001 | T.PI.IRC.002 | FS-GA-0220 THRU 0225 | T |
| SAIC/TARC | Civil | I. COTTLE | CI-032 | T.CI.IRC.003 | FS-GA-0015 B5 | T |
| SAIC/TARC | Civil | I. COTTLE | CI-011 | T.CI.IRC.004 | FS-GA-0011 D-C | T |
| SAIC/TARC | Shaft | I. COTTLE | SH-074 | T.SH.IRC.005 | FS-GA-0063 | T |
| SAIC/TARC | Civil | I. COTTLE | CI-077 | T.CI.IRC.006 | FS-GA-0041 SECTION A-A | T |
| SAIC/TARC | Shaft | I. COTTLE | SH-047 | T.SH.IRC.007 | FS-GA-0058 DETAIL 1 | T |
| SAIC/TARC | Shaft | I. COTTLE | SH-049 | T.SH.IRC.008 | FS-GA-0059 B-5, STEP 3 | T |
| SAIC/TARC | Mining | I. COTTLE | MI-018 | T.MI.IRC.009 | FS-GA-0160 | T |
| SAIC/TARC | Shaft | I. COTTLE | SH-159 | T.SH.IRC.010 | FS-SP-1414 1.3 | T |
| SAIC/TARC | Shaft | I. COTTLE | SH-161 | T.SH.IRC.011 | FS-SP-1418 1.3 | T |
| SAIC/TARC | Mining | I. COTTLE | MI-111 | T.MI.IRC.012 | FS-SP-0205 SECTION 3.5 | T |
| SAIC/TARC | General | I. COTTLE | GE-039 | T.GE.IRC.013 | GENERAL F&S SPECIFICATION | T |
| SAIC/TARC | General | I. COTTLE | GE-042 | T.GE.IRC.014 | GENERAL F&S SPECIFICATION | T |
| SAIC/TARC | Mining | I. COTTLE | MI-093 | T.MI.IRC.015 | FS-SP-0205 SECTION 1.5 | T |
| SAIC/TARC | General | I. COTTLE | GE-027 | T.GE.IRC.016 | GENERAL H&N SPECIFICATIONS | T |
| SAIC/TARC | Architectural/St | I. COTTLE | AS-004 | T.AS.IRC.017 | SECTION 03001 PLAIN AND REINFORCED CONCRETE | T |
| SAIC/TARC | General | I. COTTLE | GE-028 | T.GE.IRC.018 | GENERAL H&N DIVISION 1 SPECIFICATIONS | T |
| SAIC/TARC | Civil | I. COTTLE | CI-211 | T.CI.IRC.019 | SECTION 02611 | T |
| SAIC/TARC | General | I. COTTLE | GE-008 | T.GE.IRC.020 | GENERAL | T |
| SAIC/TARC | Mining | I. COTTLE | MI-089 | T.MI.IRC.021 | FS-SP-0204 SECTION 3.13 | T |
| SAIC/TARC | Mining | I. COTTLE | MI-083 | T.MI.IRC.022 | FS-SP-0204 SECTION 3.1.3 | T |
| SAIC/TARC | Mining | I. COTTLE | MI-086 | T.MI.IRC.023 | FS-SP-0204 3.5 SURVEY WORK | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| I. COTTLE | 17 | 5 | 1 | 23 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITI |
|--------------|------------------|------------|---------------------------|--------------|--------------------|------------------------|
| SAIC/QA | Shaft | J. JARDINE | SH-067 | F.SH.JAJ.001 | FS-GA-0062 | R/B T |
| SAIC/QA | Shaft | J. JARDINE | SH-068 | F.SH.JAJ.002 | FS-GA-0062 | R/B T |
| SAIC/QA | Shaft | J. JARDINE | SH-114 | F.SH.JAJ.003 | FS-GA-0102 | R/B T |
| SAIC/QA | Civil | J. JARDINE | CI-049 | F.CI.JAJ.004 | FS-GA-0025 | R/B THRU 0028 R/B T |
| SAIC/QA | Electrical | J. JARDINE | EL-002 | F.EL.JAJ.005 | FS-GA-0200 | R/B, 0213 R/B T |
| SAIC/QA | Ventilation | J. JARDINE | VE-006 | F.VE.JAJ.006 | FS-GA-0227 | R/B T |
| SAIC/QA | General | J. JARDINE | GE-008 | F.GE.JAJ.007 | GENERAL F&S | T |
| SAIC/QA | General | J. JARDINE | GE-009 | F.GE.JAJ.008 | GENERAL F&S | T |
| SAIC/QA | Mechanical | J. JARDINE | ME-002 | F.ME.JAJ.009 | FS-SP-0504 | T |
| SAIC/QA | Mechanical | J. JARDINE | ME-001 | F.ME.JAJ.010 | FS-SP-0504 | T |
| SAIC/QA | Mechanical | J. JARDINE | ME-007 | F.ME.JAJ.011 | FS-SP-0902 | T |
| SAIC/QA | Mechanical | J. JARDINE | ME-004 | F.ME.JAJ.012 | FS-SP-0902 | T |
| SAIC/QA | Mechanical | J. JARDINE | ME-005 | F.ME.JAJ.013 | FS-SP-0902 | T |
| SAIC/QA | Mechanical | J. JARDINE | ME-006 | F.ME.JAJ.014 | FS-SP-0902 | T |
| SAIC/QA | Mechanical | J. JARDINE | ME-003 | F.ME.JAJ.015 | FS-SP-0902 | T |
| SAIC/QA | Mechanical | J. JARDINE | ME-008 | F.ME.JAJ.016 | FS-SP-0902 | T |
| SAIC/QA | Mining | J. JARDINE | MI-143 | F.MI.JAJ.017 | FS-SP-1107 | T |
| SAIC/QA | Shaft | J. JARDINE | SH-149 | F.SH.JAJ.018 | FS-SP-0301 | T |
| SAIC/QA | Mining | J. JARDINE | MI-078 | F.MI.JAJ.019 | FS-SP-0204 | PARA. 1.4.1 T |
| SAIC/QA | Mechanical | J. JARDINE | ME-009 | F.ME.JAJ.020 | FS-SP-0902 | PARA. 1.4.1 T |
| SAIC/QA | Electrical | J. JARDINE | EL-036 | F.EL.JAJ.021 | FS-SP-1611 | PARA. 1.4.1 T |
| SAIC/QA | Electrical | J. JARDINE | EL-024 | F.EL.JAJ.022 | FS-SP-1602 | PARA. 1.3.4 T |
| SAIC/QA | General | J. JARDINE | GE-042 | F.GE.JAJ.023 | GENERAL | H&N DIVISION 15.A T |
| SAIC/QA | Architectural | J. JARDINE | AR-029 | F.AR.JAJ.024 | JS-025-6002-A1 | .A T |
| SAIC/QA | Architectural/St | J. JARDINE | AS-006 | F.AS.JAJ.025 | SECTION 04000 | .A PARA. 1.05 T |
| SAIC/QA | Electrical | J. JARDINE | EL-069 | F.EL.JAJ.026 | SECTION 16903 | .A T |
| SAIC/QA | Civil | J. JARDINE | CI-016 | F.CI.JAJ.027 | JS-025-ESF-C4 | .B T |
| SAIC/QA | General | J. JARDINE | GE-020 | F.GE.JAJ.028 | GENERAL | T |
| SAIC/QA | Architectural/St | J. JARDINE | AS-009 | F.AS.JAJ.029 | SECTION 05120 | .A T |
| SAIC/QA | General | J. JARDINE | GE-010 | F.GE.JAJ.030 | GENERAL H&N | T |
| SAIC/QA | General | J. JARDINE | GE-005 | F.GE.JAJ.031 | GENERAL H&N | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-------------------------------|-------------------|
| J. JARDINE | 22 | 7 | 2 | 31 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------------|---------------|---------------------------|--------------|--------------------|-------------|
| WESTON | General | J. MONTGOMERY | GE-024 | K.GE.JEM.001 | GENERAL | T |
| WESTON | Civil | J. MONTGOMERY | CI-039 | K.CI.JEM.002 | FS-GA-0025 | T |
| WESTON | Ventilation | J. MONTGOMERY | VE-010 | K.VE.JEM.003 | FS-GA-0228 C5 | T |
| WESTON | Ventilation | J. MONTGOMERY | VE-007 | K.VE.JEM.004 | FS-GA-0228 | T |
| WESTON | General | J. MONTGOMERY | GE-015 | K.GE.JEM.005 | GENERAL F&S | T |
| WESTON | Mining | J. MONTGOMERY | MI-020 | K.MI.JEM.006 | FS-GA-0160 | T |
| WESTON | General | J. MONTGOMERY | GE-014 | K.GE.JEM.007 | GENERAL F&S | T |
| WESTON | General | J. MONTGOMERY | GE-016 | K.GE.JEM.008 | GENERAL F&S | T |
| WESTON | Mining | J. MONTGOMERY | MI-076 | K.MI.JEM.009 | FS-GA-0199 B-4 | T |
| WESTON | Piping & Instrum | J. MONTGOMERY | PI-011 | K.PI.JEM.010 | FS-GA-0222 | T |
| WESTON | Mining | J. MONTGOMERY | MI-050 | K.MI.JEM.011 | FS-GA-0164 B7 | T |
| WESTON | General | J. MONTGOMERY | GE-011 | K.GE.JEM.012 | GENERAL H&N | T |
| WESTON | General | J. MONTGOMERY | GE-013 | K.GE.JEM.013 | GENERAL F&S | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|---------------|-----------------------|-----------------------|-------------------------------|-------------------|
| J. MONTGOMERY | 11 | 1 | 1 | 13 |

09/26/88

Page 1

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITIC |
|--------------|------------|---------------|---------------------------|--------------|--------------------|------------|
| SAIC/TARC | Electrical | J. MCCONVILLE | EL-048 | T.EL.JHM.001 | JS-025-ESF-W10 B | T |
| SAIC/TARC | Mechanical | J. MCCONVILLE | ME-053 | T.ME.JHM.002 | JS-025-6002-M4 | T |
| SAIC/TARC | Mechanical | J. MCCONVILLE | ME-013 | T.ME.JHM.003 | JS-025-ESF-FP4 B | T |
| SAIC/TARC | General | J. MCCONVILLE | GE-013 | T.GE.JHM.004 | GENERAL | T |
| SAIC/TARC | Mechanical | J. MCCONVILLE | ME-054 | T.ME.JHM.005 | JS-025-6002-M4 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|---------------|-----------------------|-----------------------|-------------------------------|-------------------|
| J. MCCONVILLE | 0 | 4 | 1 | 5 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------------|----------|---------------------------|--------------|---------------------------------------|-------------|
| REECO | Mechanical | J. BETTS | ME-001 | R.ME.JLB.001 | JS-025-ESF-FP1 B | T |
| REECO | Mechanical | J. BETTS | ME-027 | R.ME.JLB.002 | JS-025-ESF-FP9 B | T |
| REECO | Electrical | J. BETTS | EL-002 | R.EL.JLB.003 | JS-025-6000-E2 B | T |
| REECO | Electrical | J. BETTS | EL-007 | R.EL.JLB.004 | JS-025-6000-W1 B | T |
| REECO | Architectural | J. BETTS | AR-019 | R.AR.JLB.005 | JS-025-6001-A2 A | T |
| REECO | Architectural | J. BETTS | AR-017 | R.AR.JLB.006 | JS-025-6001-A2 A | T |
| REECO | Architectural | J. BETTS | AR-024 | R.AR.JLB.007 | JS-025-6002-A1 A | T |
| REECO | Architectural | J. BETTS | AR-032 | R.AR.JLB.008 | JS-025-6006-A1 B | T |
| REECO | Mechanical | J. BETTS | ME-077 | R.ME.JLB.009 | JS-025-6006-FP2 B | T |
| REECO | Architectural | J. BETTS | AR-046 | R.AR.JLB.010 | JS-025-6008-A1 A | T |
| REECO | Architectural | J. BETTS | AR-044 | R.AR.JLB.011 | JS-025-6008-A1 A | T |
| REECO | Civil | J. BETTS | CI-065 | R.CI.JLB.012 | FS-GA-0031 | T |
| REECO | Shaft | J. BETTS | SH-124 | R.SH.JLB.013 | FS-GA-0113 | T |
| REECO | General | J. BETTS | GE-027 | R.GE.JLB.014 | GENERAL | T |
| REECO | Mechanical | J. BETTS | ME-035 | R.ME.JLB.015 | JS-025-ESF-FP12 B | T |
| REECO | Mechanical | J. BETTS | ME-012 | R.ME.JLB.016 | JS-025-ESF-FP4 B | T |
| REECO | Architectural/St | J. BETTS | AS-014 | R.AS.JLB.017 | SECTION 07200 A, PART 1.03(A) | T |
| REECO | Architectural/St | J. BETTS | AS-018 | R.AS.JLB.018 | SECTION 07200 A, PARTS 2.02(C)&(1) | T |
| REECO | Architectural/St | J. BETTS | AS-021 | R.AS.JLB.019 | SECTION 07465 A, PART 2.02 (J) | T |
| REECO | Architectural/St | J. BETTS | AS-023 | R.AS.JLB.020 | SECTION 07900 A, PART 1.03 | T |
| REECO | Architectural/St | J. BETTS | AS-024 | R.AS.JLB.021 | SECTION 07900 A, PART 2.01(1) | T |
| REECO | Architectural/St | J. BETTS | AS-025 | R.AS.JLB.022 | SECTION 08100 A, PART 1.03 | T |
| REECO | Architectural/St | J. BETTS | AS-030 | R.AS.JLB.023 | SECTION 08100 A, PART 1.06(A) | T |
| REECO | Architectural/St | J. BETTS | AS-032 | R.AS.JLB.024 | SECTION 08100 A, PART 2.01(A)&(B) | T |
| REECO | Architectural/St | J. BETTS | AS-037 | R.AS.JLB.025 | SECTION 08500 A, PART 1.03 | T |
| REECO | Architectural/St | J. BETTS | AS-039 | R.AS.JLB.026 | SECTION 08500 A, PARTS 2.01(A)&(B) | T |
| REECO | Architectural/St | J. BETTS | AS-036 | R.AS.JLB.027 | SECTION 08500 A | T |
| REECO | Architectural/St | J. BETTS | AS-041 | R.AS.JLB.028 | SECTION 08700 A, PART 1.03 | T |
| REECO | Architectural/St | J. BETTS | AS-042 | R.AS.JLB.029 | SECTION 08700 A, PART 2.06(A) | T |
| REECO | Architectural/St | J. BETTS | AS-044 | R.AS.JLB.030 | SECTION 08800 A | T |
| REECO | Architectural/St | J. BETTS | AS-047 | R.AS.JLB.031 | SECTION 09260 A, PART 1.03 | T |
| REECO | Architectural/St | J. BETTS | AS-046 | R.AS.JLB.032 | SECTION 09260 A, PART 1.03(A) | T |
| REECO | Architectural/St | J. BETTS | AS-052 | R.AS.JLB.033 | SECTION 09260 A, PART 2.02(E)(2) | T |
| REECO | Architectural/St | J. BETTS | AS-057 | R.AS.JLB.034 | SECTION 09686 A, PART 1.03 | T |
| REECO | Architectural/St | J. BETTS | AS-060 | R.AS.JLB.035 | SECTION 09686 A, PART 1.07 | T |
| REECO | Architectural/St | J. BETTS | AS-062 | R.AS.JLB.036 | SECTION 09686 A, PART 2.02(F)(6) | T |
| REECO | General | J. BETTS | GE-040 | R.GE.JLB.037 | GENERAL SPECIFICATIONS | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| J. BETTS | 2 | 33 | 2 | 37 |

09/26/88

Page 1

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITIC |
|--------------|---------------|--------------|---------------------------|--------------|---|------------|
| SAIC/TARC | General | J. DAVENPORT | GE-014 | T.GE.JMD.001 | GENERAL | T |
| SAIC/TARC | Architectural | J. DAVENPORT | AR-031 | T.AR.JMD.002 | JS-025-6006-A1 B | T |
| SAIC/TARC | Architectural | J. DAVENPORT | AR-049 | T.AR.JMD.003 | JS-025-058-1-A1 A | T |
| SAIC/TARC | Shaft | J. DAVENPORT | SH-070 | T.SH.JMD.004 | FS-GA-0062 TITLE: ES-1 SHAFT LINER SECTIONS & DETAILS | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|--------------|-----------------------|-----------------------|-------------------------------|-------------------|
| J. DAVENPORT | 1 | 2 | 1 | 4 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|-------------|-----------|---------------------------|--------------|--------------------|-------------|
| MSHA | General | J. WIDOWS | GE-019 | M.GE.JW.001 | GENERAL | T |
| MSHA | Civil | J. WIDOWS | CI-004 | M.CI.JW.002 | FS-GA-0011 | T |
| MSHA | Civil | J. WIDOWS | CI-075 | M.CI.JW.003 | FS-GA-0040 | T |
| MSHA | Ventilation | J. WIDOWS | VE-005 | M.VE.JW.004 | FS-GA-0227 | T |
| MSHA | General | J. WIDOWS | GE-035 | M.GE.JW.005 | GENERAL | T |
| MSHA | General | J. WIDOWS | GE-036 | M.GE.JW.006 | GENERAL | T |
| MSHA | General | J. WIDOWS | GE-037 | M.GE.JW.007 | GENERAL | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO M&N | TRANSMITTED TO F&S AND M&N | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| J. WIDOWS | 3 | 0 | 4 | 7 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------------|------------|---------------------------|--------------|--------------------|--|
| REECO | Shaft | L. CREVELT | SH-132 | R.SH.LGC.001 | FS-SP-0201 | 2.2, PAGE 2 T |
| REECO | Shaft | L. CREVELT | SH-134 | R.SH.LGC.002 | FS-SP-0201 | 3.1.1,3.1.2 T |
| REECO | General | L. CREVELT | GE-041 | R.GE.LGC.003 | GENERAL | PP.2 & 3 F&S TECHNICAL SPEC. T |
| REECO | Shaft | L. CREVELT | SH-139 | R.SH.LGC.004 | FS-SP-0202 | 1.2.3, PAGE 1 T |
| REECO | Shaft | L. CREVELT | SH-141 | R.SH.LGC.005 | FS-SP-0202 | 3.1,3.2,3.3, PP 3&4 T |
| REECO | Shaft | L. CREVELT | SH-145 | R.SH.LGC.006 | FS-SP-0203 | 1.2.3 PAGE 1 T |
| REECO | Shaft | L. CREVELT | SH-147 | R.SH.LGC.007 | FS-SP-0203 | 3.3, 3.4, AND 3.5 T |
| REECO | Shaft | L. CREVELT | SH-151 | R.SH.LGC.008 | FS-SP-0301 | F&S T |
| REECO | Shaft | L. CREVELT | SH-157 | R.SH.LGC.009 | FS-SP-1409 | 1.3 PAGE 2 T |
| REECO | Mining | L. CREVELT | MI-084 | R.MI.LGC.010 | FS-SP-0204 | 3.5 PAGE 6 T |
| REECO | Mining | L. CREVELT | MI-090 | R.MI.LGC.011 | FS-SP-0205 | 1.2 PAGE 1 T |
| REECO | Mining | L. CREVELT | MI-091 | R.MI.LGC.012 | FS-SP-0205 | 1.3.3 PAGE 1 T |
| REECO | Mining | L. CREVELT | MI-092 | R.MI.LGC.013 | FS-SP-0205 | 1.5 PAGE 2 T |
| REECO | Mining | L. CREVELT | MI-094 | R.MI.LGC.014 | FS-SP-0205 | 1.6 PAGE 3 T |
| REECO | Mining | L. CREVELT | MI-096 | R.MI.LGC.015 | FS-SP-0205 | 1.8, PAGE 4 T |
| REECO | Mining | L. CREVELT | MI-098 | R.MI.LGC.016 | FS-SP-0205 | 2.1.1, PAGE 5 T |
| REECO | Mining | L. CREVELT | MI-099 | R.MI.LGC.017 | FS-SP-0205 | 2.1.2 T |
| REECO | Mining | L. CREVELT | MI-107 | R.MI.LGC.018 | FS-SP-0205 | 3.5, PAGE 7 T |
| REECO | Mining | L. CREVELT | MI-109 | R.MI.LGC.019 | FS-SP-0205 | 3.5.2, PAGE 8 T |
| REECO | Mining | L. CREVELT | MI-113 | R.MI.LGC.020 | FS-SP-0205 | 3.6, PAGE 9 T |
| REECO | Mining | L. CREVELT | MI-120 | R.MI.LGC.021 | FS-SP-0205 | 3.11, PAGE 9 T |
| REECO | Mechanical | L. CREVELT | ME-010 | R.ME.LGC.022 | FS-SP-1500 | 1.4 SUBMITTALS, PAGE 1 T |
| REECO | Electrical | L. CREVELT | EL-020 | R.EL.LGC.023 | FS-SP-1600 | 1.4 SUBMITTALS T |
| REECO | Electrical | L. CREVELT | EL-022 | R.EL.LGC.024 | FS-SP-1602 | - 1604 PAGE 4, FABRICATION T |
| REECO | Electrical | L. CREVELT | EL-026 | R.EL.LGC.025 | FS-SP-1603 | 1607,1609,1611-1619 T |
| REECO | Electrical | L. CREVELT | EL-023 | R.EL.LGC.026 | FS-SP-1602 | 1619, 1.2.2 T |
| REECO | General | L. CREVELT | GE-029 | R.GE.LGC.027 | SECTION 01005 | 2.02A T |
| REECO | General | L. CREVELT | GE-040 | R.GE.LGC.028 | SECTION 01720 | 302 B T |
| REECO | Architectural/St | L. CREVELT | AS-007 | R.AS.LGC.029 | SECTION 05120 | 05210.A T |
| REECO | Architectural/St | L. CREVELT | AS-010 | R.AS.LGC.030 | SECTION 05300 | T |
| REECO | Architectural/St | L. CREVELT | AS-011 | R.AS.LGC.031 | SECTION 05400 | 3.01 INSPECTION T |
| REECO | Architectural/St | L. CREVELT | AS-012 | R.AS.LGC.032 | SECTION 07175 | 3.01,3.02,3.03, P.4 T |
| REECO | Architectural/St | L. CREVELT | AS-016 | R.AS.LGC.033 | SECTION 07200 | PAGE 3, 1.05 T |
| REECO | Architectural/St | L. CREVELT | AS-020 | R.AS.LGC.034 | SECTION 07465 | 2.01, PAGE 3 T |
| REECO | Architectural/St | L. CREVELT | AS-022 | R.AS.LGC.035 | SECTION 07631 | AND 07900.A T |
| REECO | Architectural/St | L. CREVELT | AS-031 | R.AS.LGC.036 | SECTION 08100 | 2.01 T |
| REECO | General | L. CREVELT | GE-041 | R.GE.LGC.037 | GENERAL H&N | SECTION DIV. 15 T |
| REECO | General | L. CREVELT | GE-044 | R.GE.LGC.038 | GENERAL H&N | SECTION DIV. 16 T |
| REECO | Mining | L. CREVELT | MI-122 | R.MI.LGC.039 | FS-SP-0205 | DATA T |
| REECO | Mining | L. CREVELT | MI-123 | R.MI.LGC.040 | FS-SP-0205 | REQUIREMENT LIST DATA REQUIREMENTS LIST |

| | | | | | | | |
|-------|------------------|------------|--------|--------------|---------------|------------------------------|---|
| REECO | Mining | L. CREVELT | MI-124 | R.MI.LGC.041 | FS-SP-0205 | DATA REQUIREMENTS LIST | T |
| SEC | Architectural/St | L. CREVELT | AS-008 | R.AS.LGC.042 | SECTION 05120 | AND 05210.A | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO N&N | TRANSMITTED TO F&S AND N&N | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-------------------------------|-------------------|
| L. CREVELT | 28 | 13 | 1 | 42 |

**COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER**

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|---------------|-----------|---------------------------|--------------|--------------------|-------------------|
| REECO | Electrical | L. FLORES | EL-004 | R.EL.LJF.001 | FS-GA-0200 | REV B B6 T |
| REECO | Electrical | L. FLORES | EL-008 | R.EL.LJF.002 | FS-GA-0201 | REV B 7B AND 6B T |
| REECO | Electrical | L. FLORES | EL-001 | R.EL.LJF.003 | FS-GA-0200 | B D7 T |
| REECO | Electrical | L. FLORES | EL-007 | R.EL.LJF.004 | FS-GA-0201 | B C5 T |
| REECO | Electrical | L. FLORES | EL-034 | R.EL.LJF.005 | JS-025-ESF-E5 | B T |
| REECO | Civil | L. FLORES | C1-166 | R.C1.LJF.006 | JS-025-ESF-C44 | B C3 T |
| REECO | Electrical | L. FLORES | EL-060 | R.EL.LJF.007 | JS-025-ESF-W5 | B T |
| REECO | Electrical | L. FLORES | EL-039 | R.EL.LJF.008 | JS-025-ESF-E6 | B T |
| REECO | Electrical | L. FLORES | EL-005 | R.EL.LJF.009 | JS-025-6000-W1 | B T |
| REECO | Electrical | L. FLORES | EL-003 | R.EL.LJF.010 | JS-025-6000-E2 | B C11 T |
| REECO | Electrical | L. FLORES | EL-014 | R.EL.LJF.011 | FS-GA-0204 | REV B C4 T |
| REECO | Electrical | L. FLORES | EL-003 | R.EL.LJF.012 | FS-GA-0200 | REV B B4 & B7 T |
| REECO | Electrical | L. FLORES | EL-004 | R.EL.LJF.013 | JS-025-6000-E2 | B E8 T |
| REECO | Architectural | L. FLORES | AR-026 | R.AR.LJF.014 | JS-025-6002-A1 | A T |
| REECO | Electrical | L. FLORES | EL-012 | R.EL.LJF.015 | JS-025-6006-E1 | B F7 T |
| REECO | Electrical | L. FLORES | EL-044 | R.EL.LJF.016 | JS-025-ESF-E6 | B D7 T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| L. FLORES | 6 | 10 | 0 | 16 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|----------|---------------------------|--------------|--------------------|-------------|
| WMPO | Shaft | L. OWENS | SH-105 | J.SH.LJO.001 | FS-GA-0100 | T |
| WMPO | Shaft | L. OWENS | SH-021 | J.SH.LJO.002 | FS-GA-0050 | GENERAL T |
| WMPO | Shaft | L. OWENS | SH-018 | J.SH.LJO.003 | FS-GA-0050 | A-5 T |
| WMPO | Shaft | L. OWENS | SH-020 | J.SH.LJO.004 | FS-GA-0050 | GENERAL T |
| WMPO | Civil | L. OWENS | CI-033 | J.CI.LJO.005 | FS-GA-0015 | B5 T |
| WMPO | Civil | L. OWENS | CI-026 | J.CI.LJO.006 | FS-GA-0015 | T |
| WMPO | Civil | L. OWENS | CI-012 | J.CI.LJO.007 | FS-GA-0012 | T |
| WMPO | Civil | L. OWENS | CI-041 | J.CI.LJO.008 | FS-GA-0025 | T |
| WMPO | Civil | L. OWENS | CI-023 | J.CI.LJO.009 | FS-GA-0014 | T |
| WMPO | Shaft | L. OWENS | SH-080 | J.SH.LJO.010 | FS-GA-0072 | T |
| WMPO | Shaft | L. OWENS | SH-094 | J.SH.LJO.011 | FS-GA-0085 | T |
| WMPO | Shaft | L. OWENS | SH-075 | J.SH.LJO.012 | FS-GA-0063 | T |
| WMPO | Mining | L. OWENS | MI-005 | J.MI.LJO.013 | FS-GA-0150 | T |
| WMPO | Shaft | L. OWENS | SH-119 | J.SH.LJO.014 | FS-GA-0113 | T |
| WMPO | Shaft | L. OWENS | SH-115 | J.SH.LJO.015 | FS-GA-0110 | T |
| WMPO | Mining | L. OWENS | MI-026 | J.MI.LJO.016 | FS-GA-0160 | T |
| WMPO | Shaft | L. OWENS | SH-057 | J.SH.LJO.017 | FS-GA-0062 | T |
| WMPO | Civil | L. OWENS | CI-035 | J.CI.LJO.018 | FS-GA-0016 | T |
| WMPO | Electrical | L. OWENS | EL-032 | J.EL.LJO.019 | JS-025-ESF-E4 | B T |
| WMPO | Electrical | L. OWENS | EL-028 | J.EL.LJO.020 | JS-025-ESF-E3 | A T |
| WMPO | Electrical | L. OWENS | EL-035 | J.EL.LJO.021 | JS-025-ESF-E5 | B T |
| WMPO | Shaft | L. OWENS | SH-106 | J.SH.LJO.022 | FS-GA-0100 | T |
| WMPO | Shaft | L. OWENS | SH-107 | J.SH.LJO.023 | FS-GA-0100 | T |
| WMPO | Shaft | L. OWENS | SH-108 | J.SH.LJO.024 | FS-GA-0100 | T |
| WMPO | Shaft | L. OWENS | SH-008 | J.SH.LJO.025 | FS-GA-0050 | T |
| WMPO | Shaft | L. OWENS | SH-011 | J.SH.LJO.026 | FS-GA-0050 | T |
| WMPO | Shaft | L. OWENS | SH-010 | J.SH.LJO.027 | FS-GA-0050 | T |
| WMPO | Shaft | L. OWENS | SH-007 | J.SH.LJO.028 | FS-GA-0050 | T |
| WMPO | Shaft | L. OWENS | SH-009 | J.SH.LJO.029 | FS-GA-0050 | T |
| WMPO | Shaft | L. OWENS | SH-002 | J.SH.LJO.030 | FS-GA-0050 | T |
| WMPO | Shaft | L. OWENS | SH-014 | J.SH.LJO.031 | FS-GA-0050 | T |
| WMPO | Shaft | L. OWENS | SH-013 | J.SH.LJO.032 | FS-GA-0050 | T |
| WMPO | Shaft | L. OWENS | SH-016 | J.SH.LJO.033 | FS-GA-0050 | T |
| WMPO | Civil | L. OWENS | CI-027 | J.CI.LJO.034 | FS-GA-0015 | T |
| WMPO | Civil | L. OWENS | CI-028 | J.CI.LJO.035 | FS-GA-0015 | T |
| WMPO | Civil | L. OWENS | CI-022 | J.CI.LJO.036 | FS-GA-0014 | T |
| WMPO | Shaft | L. OWENS | SH-081 | J.SH.LJO.037 | FS-GA-0072 | T |
| WMPO | Shaft | L. OWENS | SH-095 | J.SH.LJO.038 | FS-GA-0085 | T |
| WMPO | Mining | L. OWENS | MI-006 | J.MI.LJO.039 | FS-GA-0150 | T |
| WMPO | Shaft | L. OWENS | SH-120 | J.SH.LJO.040 | FS-GA-0113 | T |
| WMPO | Mining | L. OWENS | MI-027 | J.MI.LJO.041 | FS-GA-0160 | T |
| WMPO | Mining | L. OWENS | MI-028 | J.MI.LJO.042 | FS-GA-0160 | T |
| WMPO | Mining | L. OWENS | MI-025 | J.MI.LJO.043 | FS-GA-0160 | T |
| WMPO | Shaft | L. OWENS | SH-058 | J.SH.LJO.044 | FS-GA-0062 | T |
| WMPO | Civil | L. OWENS | CI-037 | J.CI.LJO.045 | FS-GA-0016 | T |
| WMPO | Electrical | L. OWENS | EL-029 | J.EL.LJO.046 | JS-025-ESF-E4 | T |
| WMPO | Electrical | L. OWENS | EL-030 | J.EL.LJO.047 | JS-025-ESF-E4 | T |
| WMPO | Electrical | L. OWENS | EL-031 | J.EL.LJO.048 | JS-025-ESF-E4 | T |
| WMPO | Shaft | L. OWENS | SH-085 | J.SH.LJO.049 | FS-GA-0072 | T |
| WMPO | Civil | L. OWENS | CI-057 | J.CI.LJO.050 | FS-GA-0027 | T |
| WMPO | Civil | L. OWENS | CI-051 | J.CI.LJO.051 | FS-GA-0026 | T |
| WMPO | Civil | L. OWENS | CI-053 | J.CI.LJO.052 | FS-GA-0026 | T |
| WMPO | General | L. OWENS | GE-006 | J.GE.LJO.053 | GENERAL F&S | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| L. OWENS | 47 | 6 | 0 | 53 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|----------|---------------------------|--------------|--|-------------|
| REECO | Electrical | M. FOX | EL-041 | R.EL.MAF.001 | JS-025-ESF-E7 A | T |
| REECO | Electrical | M. FOX | EL-040 | R.EL.MAF.002 | JS-025-ESF-E6 B | T |
| REECO | Electrical | M. FOX | EL-042 | R.EL.MAF.003 | JS-025-ESF-E8 A | T |
| REECO | Electrical | M. FOX | EL-043 | R.EL.MAF.004 | JS-025-ESF-E9 A | T |
| REECO | Mechanical | M. FOX | ME-003 | R.ME.MAF.005 | JS-025-ESF-FP1 B THRU FP4.B | T |
| REECO | Mechanical | M. FOX | ME-018 | R.ME.MAF.006 | JS-025-ESF-FP5 B THRU FP13 B | T |
| REECO | Civil | M. FOX | CI-149 | R.CI.MAF.007 | JS-025-ESF-C43 B | T |
| REECO | Civil | M. FOX | CI-167 | R.CI.MAF.008 | JS-025-ESF-C44 | T |
| REECO | Electrical | M. FOX | EL-021 | R.EL.MAF.009 | JS-025-ESF-E2 A | T |
| REECO | General | M. FOX | GE-006 | R.GE.MAF.010 | GENERAL H&N | T |
| REECO | General | M. FOX | GE-010 | R.GE.MAF.011 | GENERAL F&S TYPICAL DRAWING | T |
| REECO | Shaft | M. FOX | SH-129 | R.SH.MAF.012 | FS-SP-0201 | T |
| REECO | Shaft | M. FOX | SH-150 | R.SH.MAF.013 | FS-SP-0301 | T |
| REECO | General | M. FOX | GE-011 | R.GE.MAF.014 | GENERAL F&S SPECIFICATIONS QA SECTION | T |
| REECO | General | M. FOX | GE-007 | R.GE.MAF.015 | GENERAL H&N | T |
| REECO | General | M. FOX | GE-012 | R.GE.MAF.016 | GENERAL F&S TYPICAL | T |
| REECO | Mechanical | M. FOX | ME-020 | R.ME.MAF.017 | FS-SP-1510 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| A. | 6 | 11 | 0 | 17 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITIC |
|--------------|------------------|----------|---------------------------|--------------|------------------------|------------|
| SAIC/TARC | Civil | M. BRAKE | CI-173 | T.CI.MCB.001 | SECTION 02110 1.06.A | T |
| SAIC/TARC | Civil | M. BRAKE | CI-184 | T.CI.MCB.002 | SECTION 02211 3.01 E | T |
| SAIC/TARC | Civil | M. BRAKE | CI-178 | T.CI.MCB.003 | SECTION 02202 1.04.A | T |
| SAIC/TARC | Civil | M. BRAKE | CI-190 | T.CI.MCB.004 | SECTION 02222 3.01.D | T |
| SAIC/TARC | Civil | M. BRAKE | CI-191 | T.CI.MCB.005 | SECTION 02222 3.02.B | T |
| SAIC/TARC | Civil | M. BRAKE | CI-199 | T.CI.MCB.006 | SECTION 02223 3.01.D | T |
| SAIC/TARC | Civil | M. BRAKE | CI-201 | T.CI.MCB.007 | SECTION 02223 3.05.A | T |
| SAIC/TARC | Civil | M. BRAKE | CI-207 | T.CI.MCB.008 | SECTION 02225 3.07.A | T |
| SAIC/TARC | Civil | M. BRAKE | CI-187 | T.CI.MCB.009 | SECTION 02211 3.02.C | T |
| SAIC/TARC | Civil | M. BRAKE | CI-205 | T.CI.MCB.010 | SECTION 02225 3.01.C | T |
| SAIC/TARC | Civil | M. BRAKE | CI-220 | T.CI.MCB.011 | SECTION 02720 3.02.A | T |
| SAIC/TARC | Civil | M. BRAKE | CI-225 | T.CI.MCB.012 | SECTION 02730 3.13.B.4 | T |
| SAIC/TARC | Architectural/St | M. BRAKE | AS-002 | T.AS.MCB.013 | SECTION 03001 1.04.A | T |
| SAIC/TARC | Architectural/St | M. BRAKE | AS-003 | T.AS.MCB.014 | SECTION 03001 3.04.B | T |
| SAIC/TARC | General | M. BRAKE | GE-033 | T.GE.MCB.015 | SECTION 01300 3 | T |
| SAIC/TARC | Architectural/St | M. BRAKE | AS-005 | T.AS.MCB.016 | SECTION 04000 1.04.A | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| M. BRAKE | 0 | 16 | 0 | 16 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|--------------|---------------------------|--------------|--------------------|-------------------|
| USGS | General | M. WHITFIELD | GE-001 | G.GE.MSW.001 | GENERAL F&S | T |
| USGS | General | M. WHITFIELD | GE-026 | G.GE.MSW.002 | FS-GA-0003 | GRID B-1 T |
| USGS | Mining | M. WHITFIELD | MI-046 | G.MI.MSW.003 | FS-GA-0163 | GRID A-5, A-7 T |
| USGS | General | M. WHITFIELD | GE-027 | G.GE.MSW.004 | FS-GA-0003 | GRID B-3 T |
| USGS | Mechanical | M. WHITFIELD | ME-021 | G.ME.MSW.005 | JS-025-ESF-FP8 | .B GRID D-7 T |
| USGS | Mechanical | M. WHITFIELD | ME-031 | G.ME.MSW.006 | JS-025-ESF-FP12 | .B GRID C,D-6,7 T |
| USGS | General | M. WHITFIELD | GE-024 | G.GE.MSW.007 | FS-GA-0001 | GRID C,D-6,7 T |
| USGS | Shaft | M. WHITFIELD | SH-040 | G.SH.MSW.008 | FS-GA-0057 | GRID C-5,6 T |
| USGS | Electrical | M. WHITFIELD | EL-052 | G.EL.MSW.009 | JS-025-ESF-W14 | .B GRID C-7 T |
| USGS | Mining | M. WHITFIELD | MI-087 | G.MI.MSW.010 | FS-SP-0204 | PAGE 5, 3.3.3 T |
| USGS | Mining | M. WHITFIELD | MI-095 | G.MI.MSW.011 | FS-SP-0205 | PAGE 5 1.6 T |
| USGS | Mining | M. WHITFIELD | MI-125 | G.MI.MSW.012 | FS-SP-0205 | SHEET 15 T |
| USGS | Shaft | M. WHITFIELD | SH-146 | G.SH.MSW.013 | FS-SP-0203 | 3.3.1 PAGE 3 T |
| USGS | Civil | M. WHITFIELD | CI-185 | G.CI.MSW.014 | SECTION 02211 | 3.02 PAGE 3 T |
| USGS | Mechanical | M. WHITFIELD | ME-011 | G.ME.MSW.015 | FS-SP-1501 | 1.3.2 PAGE 2 T |
| USGS | Mechanical | M. WHITFIELD | ME-012 | G.ME.MSW.016 | FS-SP-1501 | 2.1.1 PAGE 3 T |
| USGS | Mechanical | M. WHITFIELD | ME-022 | G.ME.MSW.017 | FS-SP-1511 | 2.1 PAGE 1 T |
| USGS | Mechanical | M. WHITFIELD | ME-025 | G.ME.MSW.018 | FS-SP-1513 | 2.1 PAGE 1 T |
| USGS | Mechanical | M. WHITFIELD | ME-027 | G.ME.MSW.019 | FS-SP-1514 | 2.1 PAGE 1 T |
| USGS | Mechanical | M. WHITFIELD | ME-029 | G.ME.MSW.020 | FS-SP-1515 | 2.2 PAGE 1 T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|--------------|-----------------------|-----------------------|-------------------------------|-------------------|
| M. WHITFIELD | 16 | 4 | 0 | 20 |

09/26/88

Page

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSIT: |
|--------------|------------|------------|---------------------------|--------------|--|-----------|
| REECO | Civil | O. HAWORTH | CI-228 | R.CI.OLN.001 | SECTION 02731 A, 1.04, PAGE 2 | T |
| REECO | Mechanical | O. HAWORTH | ME-004 | R.ME.OLN.002 | JS-025-ESF-FP3 B | T |
| REECO | Civil | O. HAWORTH | CI-084 | R.CI.OLN.003 | JS-025-ESF-C37 B | T |
| REECO | Civil | O. HAWORTH | CI-227 | R.CI.OLN.004 | SECTION 02731 A, 1.01 PAGE 2, 3.05 PAGE 5 | T |
| REECO | Civil | O. HAWORTH | CI-229 | R.CI.OLN.005 | SECTION 02731 A, PART 3 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&M | TRANSMITTED TO F&S AND H&M | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-------------------------------|-------------------|
| O. HAWORTH | 0 | 5 | 0 | 5 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------------|-------------|---------------------------|--------------|-----------------------------------|-------------|
| NVO/SHD | General | P. PHILLIPS | GE-036 | N.GE.PEP.001 | SECTION 01400 01410 | T |
| NVO/SHD | General | P. PHILLIPS | GE-032 | N.GE.PEP.002 | SECTION 01300 01600 AND OTHERS | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-198 | N.CI.PEP.003 | SECTION 02223 3.01 | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-206 | N.CI.PEP.004 | SECTION 02225 3.05 A | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-209 | N.CI.PEP.005 | SECTION 02556 | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-223 | N.CI.PEP.006 | SECTION 02730 3.05A | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-232 | N.CI.PEP.007 | SECTION 02831 | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-236 | N.CI.PEP.008 | SECTION 02990 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-013 | N.AS.PEP.009 | SECTION 07200 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-026 | N.AS.PEP.010 | SECTION 08100 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-033 | N.AS.PEP.011 | SECTION 08330 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-038 | N.AS.PEP.012 | SECTION 08500 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-043 | N.AS.PEP.013 | SECTION 08700 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-045 | N.AS.PEP.014 | SECTION 09111 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-051 | N.AS.PEP.015 | SECTION 09260 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-054 | N.AS.PEP.016 | SECTION 09511 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-056 | N.AS.PEP.017 | SECTION 09650 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-058 | N.AS.PEP.018 | SECTION 09686 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-064 | N.AS.PEP.019 | SECTION 10270 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-065 | N.AS.PEP.020 | SECTION 13121 | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-171 | N.CI.PEP.021 | JS-025-ESF-C46 | T |
| NVO/SHD | General | P. PHILLIPS | GE-014 | N.GE.PEP.022 | JS-025-ESF-T2 .A | T |
| NVO/SHD | General | P. PHILLIPS | GE-022 | N.GE.PEP.023 | JS-025-ESF-T3 .A | T |
| NVO/SHD | General | P. PHILLIPS | GE-023 | N.GE.PEP.024 | JS-025-ESF-T4 .A | T |
| NVO/SHD | General | P. PHILLIPS | GE-025 | N.GE.PEP.025 | JS-025-ESF-T5 .A | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-026 | N.CI.PEP.026 | JS-025-ESF-C11 .B | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-077 | N.CI.PEP.027 | JS-025-ESF-C31 .B | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-154 | N.CI.PEP.028 | JS-025-ESF-C44 .B | T |
| NVO/SHD | Architectural | P. PHILLIPS | AR-001 | N.AR.PEP.029 | JS-025-ESF-A1 .A | T |
| NVO/SHD | Electrical | P. PHILLIPS | EL-027 | N.EL.PEP.030 | JS-025-ESF-E3 .A AND OTHERS | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-002 | N.ME.PEP.031 | JS-025-ESF-FP1 .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-014 | N.ME.PEP.032 | JS-025-ESF-FP4 .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-015 | N.ME.PEP.033 | JS-025-ESF-FP5 .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-020 | N.ME.PEP.034 | JS-025-ESF-FP6 .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-025 | N.ME.PEP.035 | JS-025-ESF-FP8 .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-028 | N.ME.PEP.036 | JS-025-ESF-FP9 .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-030 | N.ME.PEP.037 | JS-025-ESF-FP11 .B AND OTHERS | T |
| NVO/SHD | Electrical | P. PHILLIPS | EL-055 | N.EL.PEP.038 | JS-025-ESF-W3 .B AND OTHERS | T |
| NVO/SHD | Electrical | P. PHILLIPS | EL-059 | N.EL.PEP.039 | JS-025-ESF-W5 .B AND OTHERS | T |
| NVO/SHD | Electrical | P. PHILLIPS | EL-051 | N.EL.PEP.040 | JS-025-ESF-W12 .B | T |
| NVO/SHD | Architectural | P. PHILLIPS | AR-006 | N.AR.PEP.041 | JS-025-6000-A1 .B AND OTHERS | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-044 | N.ME.PEP.042 | JS-025-6000-FP1 .B AND OTHERS | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-046 | N.ME.PEP.043 | JS-025-6000-FP2 .B AND OTHERS | T |
| NVO/SHD | Electrical | P. PHILLIPS | EL-001 | N.EL.PEP.044 | JS-025-6000-E2 .B AND OTHERS | T |
| NVO/SHD | Architectural | P. PHILLIPS | AR-011 | N.AR.PEP.045 | JS-025-6001-A1 .B AND A2.A | T |
| NVO/SHD | Architectural | P. PHILLIPS | AR-023 | N.AR.PEP.046 | JS-025-6001-A3 .A | T |
| NVO/SHD | Architectural | P. PHILLIPS | AR-025 | N.AR.PEP.047 | JS-025-6002-A1 .A | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-059 | N.ME.PEP.048 | JS-025-6002-FP1 .B | T |
| NVO/SHD | Architectural | P. PHILLIPS | AR-033 | N.AR.PEP.049 | JS-025-6006-A1 .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-068 | N.ME.PEP.050 | JS-025-6006-FP1 .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-073 | N.ME.PEP.051 | JS-025-6006-FP2 .B | T |
| NVO/SHD | Architectural | P. PHILLIPS | AR-038 | N.AR.PEP.052 | JS-025-6007-A1 .B | T |

| | | | | | | | |
|---------|------------------|-------------|--------|--------------|-----------------|-----------------|---|
| NVO/SHD | Electrical | P. PHILLIPS | EL-016 | N.EL.PEP.053 | JS-025-6007-E1 | .B | T |
| NVO/SHD | Architectural | P. PHILLIPS | AR-045 | N.AR.PEP.054 | JS-025-6008-A1 | .A | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-084 | N.ME.PEP.055 | JS-025-6008-FP1 | .B | T |
| VO/SHD | Mechanical | P. PHILLIPS | ME-089 | N.ME.PEP.056 | JS-025-058-1FP1 | .B ALL TRAILER | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-056 | N.CI.PEP.057 | FS-GA-0027 | | T |
| NVO/SHD | Piping & Instrum | P. PHILLIPS | PI-013 | N.PI.PEP.058 | FS-GA-0230 | | T |
| NVO/SHD | General | P. PHILLIPS | GE-026 | N.GE.PEP.059 | GENERAL | | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-221 | N.CI.PEP.060 | SECTION 02730 | | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-015 | N.AS.PEP.061 | SECTION 07200 | 1.05 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-017 | N.AS.PEP.062 | SECTION 07200 | 2.02 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-019 | N.AS.PEP.063 | SECTION 07200 | 3.02 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-027 | N.AS.PEP.064 | SECTION 08100 | 1.03 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-028 | N.AS.PEP.065 | SECTION 08100 | 1.03 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-029 | N.AS.PEP.066 | SECTION 08100 | 1.0584 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-034 | N.AS.PEP.067 | SECTION 08100 | 2.03A | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-035 | N.AS.PEP.068 | SECTION 08330 | 2.03C5 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-040 | N.AS.PEP.069 | SECTION 08500 | 2.03 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-048 | N.AS.PEP.070 | SECTION 09260 | 1.03 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-049 | N.AS.PEP.071 | SECTION 09260 | 1.03G | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-050 | N.AS.PEP.072 | SECTION 09260 | 1.06 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-053 | N.AS.PEP.073 | SECTION 09260 | 2.02 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-055 | N.AS.PEP.074 | SECTION 09511 | 1.06 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-059 | N.AS.PEP.075 | SECTION 09686 | 1.04D | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-061 | N.AS.PEP.076 | SECTION 09686 | 1.07 | T |
| NVO/SHD | Architectural/St | P. PHILLIPS | AS-063 | N.AS.PEP.077 | SECTION 09686 | 2.02F6 | T |
| NVO/SHD | General | P. PHILLIPS | GE-015 | N.GE.PEP.078 | JS-025-ESF-T3 | | T |
| NVO/SHD | General | P. PHILLIPS | GE-016 | N.GE.PEP.079 | JS-025-ESF-T3 | | T |
| NVO/SHD | General | P. PHILLIPS | GE-017 | N.GE.PEP.080 | JS-025-ESF-T3 | | T |
| NVO/SHD | General | P. PHILLIPS | GE-018 | N.GE.PEP.081 | JS-025-ESF-T3 | | T |
| NVO/SHD | General | P. PHILLIPS | GE-019 | N.GE.PEP.082 | JS-025-ESF-T3 | | T |
| NVO/SHD | General | P. PHILLIPS | GE-020 | N.GE.PEP.083 | JS-025-ESF-T3 | | T |
| O/SHD | General | P. PHILLIPS | GE-021 | N.GE.PEP.084 | JS-025-ESF-T3 | | T |
| VO/SHD | General | P. PHILLIPS | GE-026 | N.GE.PEP.085 | JS-025-ESF-T5 | .A | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-155 | N.CI.PEP.086 | JS-025-ESF-C44 | .B | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-150 | N.CI.PEP.087 | JS-025-ESF-C44 | | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-152 | N.CI.PEP.088 | JS-025-ESF-C44 | | T |
| NVO/SHD | Civil | P. PHILLIPS | CI-151 | N.CI.PEP.089 | JS-025-ESF-C44 | | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-026 | N.ME.PEP.090 | JS-025-ESF-FP8 | .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-045 | N.ME.PEP.091 | JS-025-6000-FP1 | .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-047 | N.ME.PEP.092 | JS-025-6000-FP2 | .B AND OTHERS | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-048 | N.ME.PEP.093 | JS-025-6000-FP2 | .B AND OTHERS | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-058 | N.ME.PEP.094 | JS-025-6002-FP1 | .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-071 | N.ME.PEP.095 | JS-025-6006-FP1 | .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-074 | N.ME.PEP.096 | JS-025-6006-FP2 | .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-076 | N.ME.PEP.097 | JS-025-6006-FP2 | .B | T |
| NVO/SHD | Architectural | P. PHILLIPS | AR-047 | N.AR.PEP.098 | JS-025-6008-A1 | .A | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-087 | N.ME.PEP.099 | JS-025-6008-FP1 | .B | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-090 | N.ME.PEP.100 | JS-025-058-1FP1 | .B ALL TRAILERS | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-091 | N.ME.PEP.101 | JS-025-058-1FP1 | .B ALL TRAILERS | T |
| NVO/SHD | General | P. PHILLIPS | GE-043 | N.GE.PEP.102 | GENERAL F&S | | T |
| NVO/SHD | General | P. PHILLIPS | GE-040 | N.GE.PEP.103 | GENERAL F&S | | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-094 | N.ME.PEP.104 | SECTION 15140 | H&N 2.01 | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-095 | N.ME.PEP.105 | SECTION 15300 | | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-096 | N.ME.PEP.106 | SECTION 15365 | | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-098 | N.ME.PEP.107 | SECTION 15365 | | T |
| NVO/SHD | Mechanical | P. PHILLIPS | ME-097 | N.ME.PEP.108 | SECTION 15365 | | T |
| NVO/SHD | General | P. PHILLIPS | GE-045 | N.GE.PEP.109 | GENERAL H&N | ELECTRICAL | T |
| NVO/SHD | General | P. PHILLIPS | GE-028 | N.GE.PEP.110 | GENERAL | | T |
| NVO/SHD | General | P. PHILLIPS | GE-029 | N.GE.PEP.111 | GENERAL | | T |
| I/SHD | General | P. PHILLIPS | GE-030 | N.GE.PEP.112 | GENERAL | | T |
| VO/SHD | Electrical | P. PHILLIPS | EL-067 | N.EL.PEP.113 | SECTION 16721 | | T |
| NVO/SHD | Electrical | P. PHILLIPS | EL-068 | N.EL.PEP.114 | SECTION 16721 | 3.05 | T |

| | | | | | | |
|---------|---------|-------------|--------|--------------|-------------|---|
| NVO/SHD | General | P. PHILLIPS | GE-031 | N.GE.PEP.115 | GENERAL | T |
| NVO/SHD | General | P. PHILLIPS | GE-032 | N.GE.PEP.116 | GENERAL | T |
| NVO/SHD | General | P. PHILLIPS | GE-033 | N.GE.PEP.117 | GENERAL | T |
| VO/ | General | P. PHILLIPS | GE-034 | N.GE.PEP.118 | GENERAL | T |
| NVO/ | General | P. PHILLIPS | GE-041 | N.GE.PEP.119 | GENERAL F&S | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO N&N | TRANSMITTED TO F&S AND N&N | TOTAL COMMENTS |
|-------------|-----------------------|-----------------------|-------------------------------|-------------------|
| P. PHILLIPS | 5 | 106 | 8 | 119 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITI |
|--------------|---------------|-------------|---------------------------|--------------|--|-----------|
| SAIC/TARC | General | P. KARNOSKI | GE-004 | T.GE.PJK.001 | GENERAL H&M | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-038 | T.CI.PJK.002 | FS-GA-0016 0025, 0033, & 0171 | T |
| SAIC/TARC | General | P. KARNOSKI | GE-007 | T.GE.PJK.003 | GENERAL F&S ALL F&S DRAWINGS | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-012 | T.CI.PJK.004 | JS-025-ESF-C3 B G-3 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-058 | T.CI.PJK.005 | JS-025-ESF-C20 .B | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-067 | T.CI.PJK.006 | JS-025-ESF-C24 .B | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-078 | T.CI.PJK.007 | JS-025-ESF-C31 .B | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-022 | T.EL.PJK.008 | JS-025-ESF-E2 A H-3 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-023 | T.EL.PJK.009 | JS-025-ESF-E3 A H-3 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-024 | T.EL.PJK.010 | JS-025-ESF-E4 B D-3 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-025 | T.EL.PJK.011 | JS-025-ESF-E5 E6.B,E7.B,E8.A, E9.A | T |
| SAIC/TARC | Architectural | P. KARNOSKI | AR-050 | T.AR.PJK.012 | JS-025-058-2-A1 .A H-3 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-018 | T.ME.PJK.013 | FS-SP-1509 SECTION 1.4.1 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-023 | T.ME.PJK.014 | FS-SP-1511 SECTION 1.4.1 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-024 | T.ME.PJK.015 | FS-SP-1512 SECTION 1.4.1 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-021 | T.ME.PJK.016 | FS-SP-1510 SECTION 1.4.1 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-019 | T.ME.PJK.017 | FS-SP-1510 SECTION 1.4.1 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-013 | T.ME.PJK.018 | FS-SP-1501 SECTION 1.4.1 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-015 | T.ME.PJK.019 | FS-SP-1507 SECTION 1.4.1 | T |
| IC/TARC | Mechanical | P. KARNOSKI | ME-026 | T.ME.PJK.020 | FS-SP-1513 SECTION 1.4.1 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-028 | T.ME.PJK.021 | FS-SP-1514 1515, 1516 SECT.1.4.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-028 | T.EL.PJK.022 | FS-SP-1605 SECTION 1.4.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-029 | T.EL.PJK.023 | FS-SP-1605 SECTION 3.2.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-030 | T.EL.PJK.024 | FS-SP-1606 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-031 | T.EL.PJK.025 | FS-SP-1607 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-021 | T.EL.PJK.026 | FS-SP-1602 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-030 | T.ME.PJK.027 | FS-SP-1517 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-031 | T.ME.PJK.028 | FS-SP-1518 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-032 | T.ME.PJK.029 | FS-SP-1519 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-025 | T.EL.PJK.030 | FS-SP-1603 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-027 | T.EL.PJK.031 | FS-SP-1604 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-032 | T.EL.PJK.032 | FS-SP-1609 1.4.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-033 | T.EL.PJK.033 | FS-SP-1609 3.2.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-034 | T.EL.PJK.034 | FS-SP-1611 1.4.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-035 | T.EL.PJK.035 | FS-SP-1611 3.2.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-037 | T.EL.PJK.036 | FS-SP-1612 1.4.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-038 | T.EL.PJK.037 | FS-SP-1612 3.2.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-039 | T.EL.PJK.038 | FS-SP-1613 1.4.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-040 | T.EL.PJK.039 | FS-SP-1613 3.2.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-041 | T.EL.PJK.040 | FS-SP-1614 1.4.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-042 | T.EL.PJK.041 | FS-SP-1614 3.2.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-043 | T.EL.PJK.042 | FS-SP-1615 1.4.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-044 | T.EL.PJK.043 | FS-SP-1615 3.2.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-045 | T.EL.PJK.044 | FS-SP-1616 1.4.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-046 | T.EL.PJK.045 | FS-SP-1616 3.2.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-047 | T.EL.PJK.046 | FS-SP-1617 1.4.1 | T |
| IC/TARC | Electrical | P. KARNOSKI | EL-048 | T.EL.PJK.047 | FS-SP-1617 3.2.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-049 | T.EL.PJK.048 | FS-SP-1618 1.4.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-050 | T.EL.PJK.049 | FS-SP-1618 3.2.1 | T |

| | | | | | | | |
|-----------|------------------|-------------|--------|--------------|---------------|------------------------------------|---|
| SAIC/TARC | Electrical | P. KARNOSKI | EL-051 | T.EL.PJK.050 | FS-SP-1619 | 1.4.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-052 | T.EL.PJK.051 | FS-SP-1619 | 3.2.1 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-053 | T.EL.PJK.052 | FS-SP-1619 | 3.2.1 | T |
| SAIC/TARC | Mechanical | P. KARNOSKI | ME-093 | T.ME.PJK.053 | SECTION 15140 | .A 1.05 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-065 | T.EL.PJK.054 | SECTION 16010 | 1.05 | T |
| SAIC/TARC | Electrical | P. KARNOSKI | EL-066 | T.EL.PJK.055 | SECTION 16440 | 1.05 | T |
| SAIC/TARC | General | P. KARNOSKI | GE-030 | T.GE.PJK.056 | SECTION 01005 | .A | T |
| SAIC/TARC | General | P. KARNOSKI | GE-031 | T.GE.PJK.057 | SECTION 01050 | .A | T |
| SAIC/TARC | General | P. KARNOSKI | GE-034 | T.GE.PJK.058 | SECTION 01300 | .A | T |
| SAIC/TARC | General | P. KARNOSKI | GE-035 | T.GE.PJK.059 | SECTION 01400 | .A | T |
| SAIC/TARC | General | P. KARNOSKI | GE-037 | T.GE.PJK.060 | SECTION 01410 | .A 1.05 | T |
| SAIC/TARC | General | P. KARNOSKI | GE-038 | T.GE.PJK.061 | SECTION 01600 | 1.05 | T |
| SAIC/TARC | General | P. KARNOSKI | GE-039 | T.GE.PJK.062 | SECTION 01720 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-174 | T.CI.PJK.063 | SECTION 02110 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-177 | T.CI.PJK.064 | SECTION 02202 | .A | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-180 | T.CI.PJK.065 | SECTION 02211 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-194 | T.CI.PJK.066 | SECTION 02222 | .A | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-197 | T.CI.PJK.067 | SECTION 02223 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-204 | T.CI.PJK.068 | SECTION 02225 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-208 | T.CI.PJK.069 | SECTION 02500 | .A | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-210 | T.CI.PJK.070 | SECTION 02556 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-213 | T.CI.PJK.071 | SECTION 02611 | .A | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-214 | T.CI.PJK.072 | SECTION 02612 | .A | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-215 | T.CI.PJK.073 | SECTION 02613 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-216 | T.CI.PJK.074 | SECTION 02614 | .A | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-217 | T.CI.PJK.075 | SECTION 02615 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-222 | T.CI.PJK.076 | SECTION 02730 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-226 | T.CI.PJK.077 | SECTION 02731 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-233 | T.CI.PJK.078 | SECTION 02831 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-231 | T.CI.PJK.079 | SECTION 02740 | .A 1.05 | T |
| SAIC/TARC | Civil | P. KARNOSKI | CI-237 | T.CI.PJK.080 | SECTION 02990 | .A 1.05 | T |
| SAIC/TARC | Architectural/St | P. KARNOSKI | AS-001 | T.AS.PJK.081 | SECTION 03001 | .1, 05120.A,05210.A ,13121.A | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO N&N | TRANSMITTED TO F&S AND N&N | TOTAL COMMENTS |
|-------------|-----------------------|-----------------------|-------------------------------|-------------------|
| P. KARNOSKI | 42 | 39 | 0 | 81 |

09/26/88

Page 1

**COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER**

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|---------------|-----------|---------------------------|--------------|--------------------|------------------------|
| MSHA | Civil | P. TALLEY | CI-067 | M.CI.PT.001 | FS-GA-0031 | A-A T |
| MSHA | Civil | P. TALLEY | CI-019 | M.CI.PT.002 | FS-GA-0013 | A-A T |
| MSHA | Civil | P. TALLEY | CI-013 | M.CI.PT.003 | FS-GA-0012 | C-C T |
| MSHA | Architectural | P. TALLEY | AR-030 | M.AR.PT.004 | JS-025-6002-A2 | A T |
| MSHA | Shaft | P. TALLEY | SH-084 | M.SH.PT.005 | FS-GA-0072 | T |
| MSHA | Civil | P. TALLEY | CI-030 | M.CI.PT.006 | FS-GA-0015 | AND 0031 AND 0032 T |
| MSHA | Shaft | P. TALLEY | SH-036 | M.SH.PT.007 | FS-GA-0057 | T |
| MSHA | Civil | P. TALLEY | CI-034 | M.CI.PT.008 | FS-GA-0016 | T |
| MSHA | Civil | P. TALLEY | CI-017 | M.CI.PT.009 | FS-GA-0013 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| P. TALLEY | 8 | 1 | 0 | 9 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION | |
|--------------|------------|----------|---------------------------|--------------|--------------------|-------------|---|
| B OF M | Mining | R. DICK | MI-097 | B.MI.RAD.001 | FS-SP-0205 | 2.1.1 | T |
| B OF M | Mining | R. DICK | MI-100 | B.MI.RAD.002 | FS-SP-0205 | 2.1.2 | T |
| B OF M | Mining | R. DICK | MI-101 | B.MI.RAD.003 | FS-SP-0205 | 2.2.1 | T |
| B OF M | Mining | R. DICK | MI-102 | B.MI.RAD.004 | FS-SP-0205 | 2.2.2 | T |
| B OF M | Mining | R. DICK | MI-103 | B.MI.RAD.005 | FS-SP-0205 | 3.1 | T |
| B OF M | Mining | R. DICK | MI-104 | B.MI.RAD.006 | FS-SP-0205 | 3.1 | T |
| B OF M | Mining | R. DICK | MI-105 | B.MI.RAD.007 | FS-SP-0205 | 3.2 | T |
| B OF M | Mining | R. DICK | MI-106 | B.MI.RAD.008 | FS-SP-0205 | 3.4 | T |
| B OF M | Mining | R. DICK | MI-108 | B.MI.RAD.009 | FS-SP-0205 | 3.5.1.A.1 | T |
| B OF M | Mining | R. DICK | MI-110 | B.MI.RAD.010 | FS-SP-0205 | 3.5.5 | T |
| B OF M | Mining | R. DICK | MI-112 | B.MI.RAD.011 | FS-SP-0205 | 3.6 | T |
| B OF M | Mining | R. DICK | MI-118 | B.MI.RAD.012 | FS-SP-0205 | 3.10.2.1 | T |
| B OF M | Mining | R. DICK | MI-119 | B.MI.RAD.013 | FS-SP-0205 | 3.10.2.2 | T |
| B OF M | Mining | R. DICK | MI-121 | B.MI.RAD.014 | FS-SP-0205 | 3.11.1 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| R. DICK | 14 | 0 | 0 | 14 |

09/26/88

Page 1

**COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER**

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITI |
|--------------|---------------|------------|---------------------------|--------------|--------------------|------------|
| WMPO | Shaft | R. EDWARDS | SH-062 | J.SH.RDE.001 | FS-GA-0062 | DETAIL 1 T |
| WMPO | Electrical | R. EDWARDS | EL-006 | J.EL.RDE.002 | FS-GA-0201 | T |
| WMPO | Architectural | R. EDWARDS | AR-036 | J.AR.RDE.003 | JS-025-6006-A2 | A T |
| WMPO | Mechanical | R. EDWARDS | ME-010 | J.ME.RDE.004 | JS-025-ESF-FP3 | B T |
| WMPO | Mechanical | R. EDWARDS | ME-070 | J.ME.RDE.005 | JS-025-6006-FP1 | 3 T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-------------------------------|-------------------|
| R. EDWARDS | 2 | 3 | 0 | 5 |

09/26/88

Page 1

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|---------------|---------------------------|--------------|----------------------------|-------------|
| SNL | Mechanical | R. STINEBAUGH | ME-008 | S.ME.RES.001 | JS-025-ESF-FP3 .8 | T |
| SNL | Mining | R. STINEBAUGH | MI-081 | S.MI.RES.002 | FS-SP-0204 PG.3,PAR. 3.1.3 | T |
| SNL | Mining | R. STINEBAUGH | MI-117 | S.MI.RES.003 | FS-SP-0205 SEC.3.10.2.1 | T |
| | | | | | PAR. 3 | |
| SNL | Mining | R. STINEBAUGH | MI-021 | S.MI.RES.004 | FS-GA-0160 (FLEXIBILITY) | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|---------------|-----------------------|-----------------------|-------------------------------|-------------------|
| R. STINEBAUGH | 3 | 1 | 0 | 4 |

09/26/88

Page .

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITI |
|--------------|------------|------------|---------------------------|--------------|--------------------|-----------|
| B OF M | Mining | L. MUNDELL | MI-128 | B.MI.RLM.001 | FS-SP-0208 | 1-3 T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&M | TRANSMITTED TO F&S AND H&M | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-------------------------------|-------------------|
| L. MUNDELL | 1 | 0 | 0 | 1 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------------|----------|---------------------------|--------------|--------------------|----------------------|
| SAIC/TARC | General | R. TOME' | GE-015 | T.GE.RLT.001 | GENERAL | T |
| SAIC/TARC | Piping & Instrum | R. TOME' | PI-014 | T.PI.RLT.002 | FS-GA-0230 | ZONES D-4 AND D-7 |
| SAIC/TARC | Civil | R. TOME' | CI-142 | T.CI.RLT.003 | JS-025-ESF-C43 | AND C44 |
| SAIC/TARC | Architectural | R. TOME' | AR-020 | T.AR.RLT.004 | JS-025-6001-A2 | AND A3 |
| SAIC/TARC | Mechanical | R. TOME' | ME-061 | T.ME.RLT.005 | JS-025-6006-M1 | |
| SAIC/TARC | Civil | R. TOME' | CI-001 | T.CI.RLT.006 | FS-GA-0011 | |
| SAIC/TARC | Civil | R. TOME' | CI-046 | T.CI.RLT.007 | FS-GA-0025 | PLAN, ZONES A5 & A6 |
| SAIC/TARC | Civil | R. TOME' | CI-040 | T.CI.RLT.008 | FS-GA-0025 | |
| SAIC/TARC | Civil | R. TOME' | CI-048 | T.CI.RLT.009 | FS-GA-0025 | PLAN AND SECTION C-C |
| SAIC/TARC | Shaft | R. TOME' | SH-101 | T.SH.RLT.010 | FS-GA-0091 | SECTION A-A |
| SAIC/TARC | Shaft | R. TOME' | SH-111 | T.SH.RLT.011 | FS-GA-0100 | SECTION A-A |
| SAIC/TARC | Mechanical | R. TOME' | ME-014 | T.ME.RLT.012 | FS-SP-1507 | SPECIFICATION |
| SAIC/TARC | Mechanical | R. TOME' | ME-017 | T.ME.RLT.013 | FS-SP-1509 | SPECIFICATION |
| SAIC/TARC | General | R. TOME' | GE-012 | T.GE.RLT.014 | GENERAL H&N | |
| SAIC/TARC | Piping & Instrum | R. TOME' | PI-021 | T.PI.RLT.015 | FS-GA-0240 | ZONES C-3 AND C-7 |

| VIEW | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| R. TOME' | 10 | 4 | 1 | 15 |

09/26/88

Page 1

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITI |
|--------------|------------|------------|---------------------------|--------------|--------------------|-----------------------------------|
| MSHA | Mining | R. BRELAND | MI-031 | M.MI.RMB.001 | FS-GA-0160 | ZONE H10, JS-025-ESF-FP3.B T |
| MSHA | Mining | R. BRELAND | MI-029 | M.MI.RMB.002 | FS-GA-0160 | ZONE D-5 JS-025-ESF-FP3.B T |
| MSHA | Shaft | R. BRELAND | SH-063 | M.SH.RMB.003 | FS-GA-0062 | FS-GA-0102 T |
| MSHA | Shaft | R. BRELAND | SH-064 | M.SH.RMB.004 | FS-GA-0062 | FS-GA-0102 T |
| MSHA | Mining | R. BRELAND | MI-030 | M.MI.RMB.005 | FS-GA-0160 | JS-025-ESF-FP3.B T |
| MSHA | Shaft | R. BRELAND | SH-082 | M.SH.RMB.006 | FS-GA-0072 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&M | TRANSMITTED TO F&S AND H&M | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-------------------------------|-------------------|
| R. BRELAND | 6 | 0 | 0 | 6 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|---------------|-----------|---------------------------|--------------|--------------------|------------------|
| REECO | Civil | R. ROMMEL | CI-086 | R.CI.RRR.001 | JS-025-ESF-C37 | B-ZONE A/B-8/9 T |
| REECO | Architectural | R. ROMMEL | AR-002 | R.AR.RRR.002 | JS-025-ESF-A1 | A - DETAILS 19 T |
| | | | | | & 20 | |
| REECO | Architectural | R. ROMMEL | AR-004 | R.AR.RRR.003 | JS-025-6000-A1 | B - FLOOR PLAN T |
| REECO | Architectural | R. ROMMEL | AR-012 | R.AR.RRR.004 | JS-025-6001-A1 | B T |
| REECO | Architectural | R. ROMMEL | AR-018 | R.AR.RRR.005 | JS-025-6001-A2 | A T |
| REECO | Civil | R. ROMMEL | CI-021 | R.CI.RRR.006 | FS-GA-0014 | SECTION C-C T |
| REECO | Civil | R. ROMMEL | CI-072 | R.CI.RRR.007 | FS-GA-0034 | T |
| REECO | Civil | R. ROMMEL | CI-079 | R.CI.RRR.008 | FS-GA-0045 | T |
| REECO | Shaft | R. ROMMEL | SH-006 | R.SH.RRR.009 | FS-GA-0050 | T |
| REECO | Shaft | R. ROMMEL | SH-041 | R.SH.RRR.010 | FS-GA-0058 | T |
| REECO | Mining | R. ROMMEL | MI-002 | R.MI.RRR.011 | FS-GA-0150 | T |
| REECO | Mining | R. ROMMEL | MI-003 | R.MI.RRR.012 | FS-GA-0150 | T |
| REECO | Mining | R. ROMMEL | MI-017 | R.MI.RRR.013 | FS-GA-0160 | T |
| REECO | Mining | R. ROMMEL | MI-037 | R.MI.RRR.014 | FS-GA-0162 | T |
| REECO | Electrical | R. ROMMEL | EL-010 | R.EL.RRR.015 | FS-GA-0204 | T |
| REECO | Architectural | R. ROMMEL | AR-014 | R.AR.RRR.016 | JS-025-6001-A2 | A T |
| REECO | Civil | R. ROMMEL | CI-112 | R.CI.RRR.017 | JS-025-ESF-C40 | B ZONE B-8 T |
| REECO | Civil | R. ROMMEL | CI-116 | R.CI.RRR.018 | JS-025-ESF-C40 | B ZONE D-2&3 T |
| REECO | Mechanical | R. ROMMEL | ME-005 | R.ME.RRR.019 | JS-025-ESF-FP3 | 12.B ZONE E-10 T |

| | TRANSMITTED TO F&S | TRANSMITTED TO N&N | TRANSMITTED TO F&S AND N&N | TOTAL COMMENTS |
|-----------------|-----------------------|-----------------------|-------------------------------|-------------------|
| VI R. ROMMEL | 10 | 9 | 0 | 19 |

09/26/88

Page 1

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITIC |
|--------------|------------|-----------|---------------------------|--------------|----------------------------|------------|
| WMPO | General | R. WATERS | GE-003 | J.GE.RSW.001 | GENERAL H&N | T |
| WMPO | General | R. WATERS | GE-001 | J.GE.RSW.002 | GENERAL H&N | T |
| WMPO | General | R. WATERS | GE-002 | J.GE.RSW.003 | GENERAL F&S | T |
| WMPO | Civil | R. WATERS | CI-009 | J.CI.RSW.004 | JS-025-ESF-C3 B6 H&N | T |
| WMPO | Electrical | R. WATERS | EL-047 | J.EL.RSW.005 | JS-025-ESF-E7 H&N | T |
| WMPO | Mechanical | R. WATERS | ME-034 | J.ME.RSW.006 | JS-025-ESF-FP12 .B AREA 9E | T |
| WMPO | Mechanical | R. WATERS | ME-033 | J.ME.RSW.007 | JS-025-ESF-FP12 .B AREA 8E | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| R. WATERS | 1 | 6 | 0 | 7 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|----------|---------------------------|--------------|--------------------|-------------|
| USGS | General | R. CRAIG | GE-009 | G.GE.RWC.001 | GENERAL | T |
| USGS | General | R. CRAIG | GE-037 | G.GE.RWC.002 | FS-GA-0006 | 5C |
| USGS | Shaft | R. CRAIG | SH-039 | G.SH.RWC.003 | FS-GA-0057 | 28 |
| USGS | Mining | R. CRAIG | MI-033 | G.MI.RWC.004 | FS-GA-0161 | |
| USGS | Mining | R. CRAIG | MI-044 | G.MI.RWC.005 | FS-GA-0163 | A5 |
| USGS | Mining | R. CRAIG | MI-045 | G.MI.RWC.006 | FS-GA-0163 | A7 |
| USGS | Civil | R. CRAIG | CI-169 | G.CI.RWC.007 | JS-025-ESF-C45 | C, D8, D9 |
| USGS | General | R. CRAIG | GE-036 | G.GE.RWC.008 | FS-GA-0006 | B4 |
| USGS | Shaft | R. CRAIG | SH-022 | G.SH.RWC.009 | FS-GA-0050 | C/D 4-5 |
| USGS | Shaft | R. CRAIG | SH-045 | G.SH.RWC.010 | FS-GA-0058 | C4 |
| USGS | Mining | R. CRAIG | MI-024 | G.MI.RWC.011 | FS-GA-0160 | B6 |
| USGS | Mining | R. CRAIG | MI-034 | G.MI.RWC.012 | FS-GA-0161 | B7 |
| USGS | Mechanical | R. CRAIG | ME-007 | G.ME.RWC.013 | JS-025-ESF-FP3 | B, C8 |
| USGS | Mechanical | R. CRAIG | ME-022 | G.ME.RWC.014 | JS-025-ESF-FP8 | B, C8, D7 |
| USGS | Mechanical | R. CRAIG | ME-032 | G.ME.RWC.015 | JS-025-ESF-FP12 | B, C8, D7 |
| USGS | Electrical | R. CRAIG | EL-054 | G.EL.RWC.016 | JS-025-ESF-W15 | B, D7 |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| R. CRAIG | 10 | 5 | 1 | 16 |

09/26/88

Page 1

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITI |
|--------------|------------------|-----------|---------------------------|--------------|--------------------|---|
| NTOS | Civil | S. THOMAS | CI-050 | E.CI.SAT.001 | FS-GA-0025 | RV.B, FS-GA-0040 RV.B, FS-GA-0050, RV.B |
| NTOS | Ventilation | S. THOMAS | VE-003 | E.VE.SAT.002 | FS-GA-0225 | RV.B |
| NTOS | Ventilation | S. THOMAS | VE-011 | E.VE.SAT.003 | FS-GA-0228 | RV.B |
| NTOS | Piping & Instrum | S. THOMAS | PI-020 | E.PI.SAT.004 | FS-GA-0240 | RV.B |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| S. THOMAS | 4 | 0 | 0 | 4 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION | |
|--------------|---------------|----------|---------------------------|--------------|--------------------|----------------------|---|
| SAIC/TARC | General | S. SMITH | GE-010 | T.GE.SCS.001 | GENERAL | T | |
| SAIC/TARC | Civil | S. SMITH | CI-005 | T.CI.SCS.002 | FS-GA-0011 | 5B | T |
| SAIC/TARC | Civil | S. SMITH | CI-045 | T.CI.SCS.003 | FS-GA-0025 | 3C, 3B | T |
| SAIC/TARC | Shaft | S. SMITH | SH-123 | T.SH.SCS.004 | FS-GA-0113 | 7C | T |
| SAIC/TARC | Civil | S. SMITH | CI-002 | T.CI.SCS.005 | JS-025-ESF-C1 | A, 6B | T |
| SAIC/TARC | Civil | S. SMITH | CI-035 | T.CI.SCS.006 | JS-025-ESF-C16 | B, 8C | T |
| SAIC/TARC | Civil | S. SMITH | CI-066 | T.CI.SCS.007 | JS-025-ESF-C24 | B | T |
| SAIC/TARC | Civil | S. SMITH | CI-079 | T.CI.SCS.008 | JS-025-ESF-C36 | B, 2E | T |
| SAIC/TARC | Civil | S. SMITH | CI-085 | T.CI.SCS.009 | JS-025-ESF-C37 | B, 11C | T |
| SAIC/TARC | Civil | S. SMITH | CI-087 | T.CI.SCS.010 | JS-025-ESF-C37 | B | T |
| SAIC/TARC | Civil | S. SMITH | CI-103 | T.CI.SCS.011 | JS-025-ESF-C39 | B, 11C | T |
| SAIC/TARC | Civil | S. SMITH | CI-115 | T.CI.SCS.012 | JS-025-ESF-C40 | B, 7E, 6F, AND 4G | T |
| SAIC/TARC | Civil | S. SMITH | CI-168 | T.CI.SCS.013 | JS-025-ESF-C45 | B | T |
| SAIC/TARC | Mechanical | S. SMITH | ME-009 | T.ME.SCS.014 | JS-025-ESF-FP3 | B | T |
| SAIC/TARC | Mechanical | S. SMITH | ME-011 | T.ME.SCS.015 | JS-025-ESF-FP4 | B | T |
| SAIC/TARC | Mechanical | S. SMITH | ME-019 | T.ME.SCS.016 | JS-025-ESF-FP6 | B | T |
| SAIC/TARC | Mechanical | S. SMITH | ME-024 | T.ME.SCS.017 | JS-025-ESF-FP8 | B | T |
| SAIC/TARC | Mechanical | S. SMITH | ME-029 | T.ME.SCS.018 | JS-025-ESF-FP9 | B | T |
| SAIC/TARC | Mechanical | S. SMITH | ME-036 | T.ME.SCS.019 | JS-025-ESF-FP13 | B | T |
| SAIC/TARC | Electrical | S. SMITH | EL-057 | T.EL.SCS.020 | JS-025-ESF-W3 | B | T |
| SAIC/TARC | Electrical | S. SMITH | EL-063 | T.EL.SCS.021 | JS-025-ESF-W8 | B | T |
| SAIC/TARC | Electrical | S. SMITH | EL-064 | T.EL.SCS.022 | JS-025-ESF-W9 | B, 9C | T |
| SAIC/TARC | Electrical | S. SMITH | EL-006 | T.EL.SCS.023 | JS-025-6000-W1 | B | T |
| SAIC/TARC | Architectural | S. SMITH | AR-010 | T.AR.SCS.024 | JS-025-6001-A1 | B | T |
| SAIC/TARC | Architectural | S. SMITH | AR-016 | T.AR.SCS.025 | JS-025-6001-A2 | A | T |
| SAIC/TARC | Electrical | S. SMITH | EL-008 | T.EL.SCS.026 | JS-025-6001-W1 | B | T |
| SAIC/TARC | Electrical | S. SMITH | EL-009 | T.EL.SCS.027 | JS-025-6001-W1 | B | T |
| SAIC/TARC | Electrical | S. SMITH | EL-010 | T.EL.SCS.028 | JS-025-6004-E1 | B | T |
| SAIC/TARC | Mechanical | S. SMITH | ME-062 | T.ME.SCS.029 | JS-025-6006-M1 | B, 9F, 10F | T |
| SAIC/TARC | Mechanical | S. SMITH | ME-075 | T.ME.SCS.030 | JS-025-6006-FP2 | B | T |
| SAIC/TARC | Electrical | S. SMITH | EL-014 | T.EL.SCS.031 | JS-025-6006-W1 | B | T |
| SAIC/TARC | Electrical | S. SMITH | EL-017 | T.EL.SCS.032 | JS-025-6007-W1 | B | T |
| SAIC/TARC | Architectural | S. SMITH | AR-043 | T.AR.SCS.033 | JS-025-6008-A1 | A | T |
| SAIC/TARC | Mechanical | S. SMITH | ME-085 | T.ME.SCS.034 | JS-025-6008-FP1 | B | T |
| SAIC/TARC | Electrical | S. SMITH | EL-020 | T.EL.SCS.035 | JS-025-6008-W1 | B, 8E | T |
| SAIC/TARC | General | S. SMITH | GE-031 | T.GE.SCS.036 | FS-GA-0003 | | T |
| SAIC/TARC | General | S. SMITH | GE-033 | T.GE.SCS.037 | FS-GA-0004 | 4C | T |
| SAIC/TARC | General | S. SMITH | GE-034 | T.GE.SCS.038 | FS-GA-0005 | | T |
| SAIC/TARC | General | S. SMITH | GE-035 | T.GE.SCS.039 | FS-GA-0005 | | T |
| SAIC/TARC | Civil | S. SMITH | CI-006 | T.CI.SCS.040 | FS-GA-0011 | 5B | T |
| SAIC/TARC | Civil | S. SMITH | CI-010 | T.CI.SCS.041 | FS-GA-0011 | 8C | T |
| SAIC/TARC | Civil | S. SMITH | CI-008 | T.CI.SCS.042 | FS-GA-0011 | 7C | T |
| SAIC/TARC | Civil | S. SMITH | CI-007 | T.CI.SCS.043 | FS-GA-0011 | 5C, 4C | T |
| SAIC/TARC | Civil | S. SMITH | CI-031 | T.CI.SCS.044 | FS-GA-0015 | 4B | T |
| SAIC/TARC | Civil | S. SMITH | CI-044 | T.CI.SCS.045 | FS-GA-0025 | 3C | T |
| SAIC/TARC | Civil | S. SMITH | CI-042 | T.CI.SCS.046 | FS-GA-0025 | 1B | T |
| SAIC/TARC | Civil | S. SMITH | CI-054 | T.CI.SCS.047 | FS-GA-0026 | 6C | T |
| SAIC/TARC | Civil | S. SMITH | CI-058 | T.CI.SCS.048 | FS-GA-0027 | 6B | T |
| SAIC/TARC | Civil | S. SMITH | CI-059 | T.CI.SCS.049 | FS-GA-0028 | 7C, 6C | T |
| SAIC/TARC | Civil | S. SMITH | CI-061 | T.CI.SCS.050 | FS-GA-0030 | 6C | T |
| SAIC/TARC | Civil | S. SMITH | CI-074 | T.CI.SCS.051 | FS-GA-0040 | 7B | T |
| SAIC/TARC | Shaft | S. SMITH | SH-004 | T.SH.SCS.052 | FS-GA-0050 | 6D, 6B | T |

| | | | | | | | |
|-----------|------------|----------|--------|--------------|-------------|--------|---|
| SAIC/TARC | Shaft | S. SMITH | SH-026 | T.SH.SCS.053 | FS-GA-0054 | 8A | T |
| SAIC/TARC | Shaft | S. SMITH | SH-060 | T.SH.SCS.054 | FS-GA-0062 | 4C | T |
| SAIC/TARC | Shaft | S. SMITH | SH-059 | T.SH.SCS.055 | FS-GA-0062 | 5A | T |
| SAIC/TARC | Shaft | S. SMITH | SH-086 | T.SH.SCS.056 | FS-GA-0072 | 6B, 6C | T |
| SAIC/TARC | Shaft | S. SMITH | SH-099 | T.SH.SCS.057 | FS-GA-0085 | 6C | T |
| SAIC/TARC | Shaft | S. SMITH | SH-100 | T.SH.SCS.058 | FS-GA-0091 | 3C | T |
| SAIC/TARC | Shaft | S. SMITH | SH-110 | T.SH.SCS.059 | FS-GA-0100 | 6C | T |
| SAIC/TARC | Shaft | S. SMITH | SH-116 | T.SH.SCS.060 | FS-GA-0110 | 5C | T |
| SAIC/TARC | Shaft | S. SMITH | SH-122 | T.SH.SCS.061 | FS-GA-0113 | | T |
| SAIC/TARC | Mining | S. SMITH | MI-038 | T.MI.SCS.062 | FS-GA-0162 | 4B | T |
| SAIC/TARC | Mining | S. SMITH | MI-042 | T.MI.SCS.063 | FS-GA-0163 | | T |
| SAIC/TARC | Mining | S. SMITH | MI-058 | T.MI.SCS.064 | FS-GA-0166 | | T |
| SAIC/TARC | Mining | S. SMITH | MI-067 | T.MI.SCS.065 | FS-GA-0171 | 7D | T |
| SAIC/TARC | Mining | S. SMITH | MI-066 | T.MI.SCS.066 | FS-GA-0171 | 7B | T |
| SAIC/TARC | Electrical | S. SMITH | EL-011 | T.EL.SCS.067 | FS-GA-0204 | | T |
| SAIC/TARC | Electrical | S. SMITH | EL-017 | T.EL.SCS.068 | FS-GA-0207 | | T |
| SAIC/TARC | Electrical | S. SMITH | EL-019 | T.EL.SCS.069 | FS-GA-0213 | 5C, 5D | T |
| SAIC/TARC | General | S. SMITH | GE-005 | T.GE.SCS.070 | GENERAL F&S | | T |
| SAIC/TARC | General | S. SMITH | GE-023 | T.GE.SCS.071 | GENERAL F&S | | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| S. SMITH | 39 | 31 | 1 | 71 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|------------|---------------------------|--------------|---|-------------|
| LOS ALAMOS | Electrical | S. FRANCIS | EL-018 | A.EL.SDF.001 | JS-025-6007-W1 GRID G-6 TO G-11 | T |
| LOS ALAMOS | General | S. FRANCIS | GE-024 | A.GE.SDF.002 | JS-025-ESF-T4 A | T |
| LOS ALAMOS | General | S. FRANCIS | GE-032 | A.GE.SDF.003 | FS-GA-0004 B | T |
| LOS ALAMOS | Civil | S. FRANCIS | CI-006 | A.CI.SDF.004 | JS-025-ESF-C3 B GRID E-9 | T |
| LOS ALAMOS | Shaft | S. FRANCIS | SH-023 | A.SH.SDF.005 | FS-GA-0050 REV B | T |
| LOS ALAMOS | Shaft | S. FRANCIS | SH-048 | A.SH.SDF.006 | FS-GA-0058 REV B | T |
| LOS ALAMOS | Civil | S. FRANCIS | CI-052 | A.CI.SDF.007 | FS-GA-0026 REV B | T |
| LOS ALAMOS | Civil | S. FRANCIS | CI-055 | A.CI.SDF.008 | FS-GA-0026 REV B GRID C-7 | T |
| LOS ALAMOS | Shaft | S. FRANCIS | SH-052 | A.SH.SDF.009 | FS-GA-0059 REV B | T |
| LOS ALAMOS | Shaft | S. FRANCIS | SH-096 | A.SH.SDF.010 | FS-GA-0085 REV B GRID C-1 C-7 | T |
| LOS ALAMOS | Shaft | S. FRANCIS | SH-098 | A.SH.SDF.011 | FS-GA-0085 REV B GRID C-4 | T |
| LOS ALAMOS | Shaft | S. FRANCIS | SH-127 | A.SH.SDF.012 | FS-GA-0113 REV B GRID B-1 | T |
| LOS ALAMOS | Mining | S. FRANCIS | MI-062 | A.MI.SDF.013 | FS-GA-0166 REV B GRID 7-A | T |
| LOS ALAMOS | Mining | S. FRANCIS | MI-136 | A.MI.SDF.014 | FS-SP-0213 PART 1.3 2ND BULLET | T |
| LOS ALAMOS | Mining | S. FRANCIS | MI-137 | A.MI.SDF.015 | FS-SP-0214 PART 1.3 2ND BULLET | T |
| LOS ALAMOS | Shaft | S. FRANCIS | SH-135 | A.SH.SDF.016 | FS-SP-0201 PART 3.1.4 ADD THIS BULLET | T |
| LOS ALAMOS | Shaft | S. FRANCIS | SH-142 | A.SH.SDF.017 | FS-SP-0202 PART 3.5 ADD THIS BULLET, PART 3.6.1 | T |
| LOS ALAMOS | Shaft | S. FRANCIS | SH-153 | A.SH.SDF.018 | FS-SP-0308 PART 3 | T |
| LOS ALAMOS | Shaft | S. FRANCIS | SH-131 | A.SH.SDF.019 | FS-SP-0201 PART 2.1 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-------------------------------|-------------------|
| S. FRANCIS | 16 | 3 | 0 | 19 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITI |
|--------------|------------------|-------------|---------------------------|--------------|-----------------------------|-----------|
| SAIC/TARC | General | S. PHILLIPS | GE-003 | T.GE.SWP.001 | GENERAL | T |
| SAIC/TARC | Architectural | S. PHILLIPS | AR-008 | T.AR.SWP.002 | JS-025-6000-A1 .B | T |
| SAIC/TARC | General | S. PHILLIPS | GE-002 | T.GE.SWP.003 | GENERAL H&N | T |
| SAIC/TARC | Civil | S. PHILLIPS | CI-153 | T.CI.SWP.004 | JS-025-ESF-C44 .B | T |
| SAIC/TARC | Piping & Instrum | S. PHILLIPS | PI-008 | T.PI.SWP.005 | FS-GA-0222 .B GRID D-7 | T |
| SAIC/TARC | Mechanical | S. PHILLIPS | ME-037 | T.ME.SWP.006 | JS-025-6000-M4 .B | T |
| SAIC/TARC | Mechanical | S. PHILLIPS | ME-038 | T.ME.SWP.007 | JS-025-6000-M4 .B | T |
| SAIC/TARC | Mechanical | S. PHILLIPS | ME-039 | T.ME.SWP.008 | JS-025-6000-M5 .B | T |
| SAIC/TARC | Mechanical | S. PHILLIPS | ME-078 | T.ME.SWP.009 | JS-025-6007-M1 .B | T |
| SAIC/TARC | Mechanical | S. PHILLIPS | ME-043 | T.ME.SWP.010 | JS-025-6000-M7 .B GRID G-10 | T |
| SAIC/TARC | Mechanical | S. PHILLIPS | ME-050 | T.ME.SWP.011 | JS-025-6001-M2 .B | T |
| SAIC/TARC | Mechanical | S. PHILLIPS | ME-060 | T.ME.SWP.012 | JS-025-6006-M1 .B | T |
| SAIC/TARC | General | S. PHILLIPS | GE-003 | T.GE.SWP.013 | GENERAL F&S | T |
| SAIC/TARC | General | S. PHILLIPS | GE-004 | T.GE.SWP.014 | GENERAL F&S | T |
| SAIC/TARC | Mining | S. PHILLIPS | MI-049 | T.MI.SWP.015 | FS-GA-0164 GRID D-2 | T |
| SAIC/TARC | Shaft | S. PHILLIPS | SH-125 | T.SH.SWP.016 | FS-GA-0113 GRID A-7 | T |
| SAIC/TARC | Shaft | S. PHILLIPS | SH-077 | T.SH.SWP.017 | FS-GA-0072 | T |
| SAIC/TARC | Mining | S. PHILLIPS | MI-069 | T.MI.SWP.018 | FS-GA-0172 .B GRID C-7 | T |
| SAIC/TARC | Electrical | S. PHILLIPS | EL-013 | T.EL.SWP.019 | FS-GA-0204 .B | T |
| SAIC/TARC | Electrical | S. PHILLIPS | EL-015 | T.EL.SWP.020 | FS-GA-0206 .B GRID B-7 | T |
| SAIC/TARC | Shaft | S. PHILLIPS | SH-005 | T.SH.SWP.021 | FS-GA-0050 .B GRID B-6 | T |
| SAIC/TARC | Shaft | S. PHILLIPS | SH-078 | T.SH.SWP.022 | FS-GA-0072 .B GRID D-8 | T |
| SAIC/TARC | Civil | S. PHILLIPS | CI-078 | T.CI.SWP.023 | FS-GA-0043 .B GRID C-7 | T |
| SAIC/TARC | Piping & Instrum | S. PHILLIPS | PI-009 | T.PI.SWP.024 | FS-GA-0222 .B GRID C-4 | T |
| SAIC/TARC | Piping & Instrum | S. PHILLIPS | PI-019 | T.PI.SWP.025 | FS-GA-0240 .B | T |
| SAIC/TARC | Architectural | S. PHILLIPS | AR-009 | T.AR.SWP.026 | JS-025-6001-A1 .B GRID F-10 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|-------------|-----------------------|-----------------------|-------------------------------|-------------------|
| S. PHILLIPS | 14 | 11 | 1 | 26 |

9/26/88

Page 1

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|------------|---------------------------|--------------|--------------------|-------------|
| SNL | General | T. BLEJWAS | GE-051 | S.GE.TEB.001 | GENERAL | T |
| SNL | General | T. BLEJWAS | GE-021 | S.GE.TEB.002 | GENERAL | T |
| SNL | General | T. BLEJWAS | GE-022 | S.GE.TEB.003 | GENERAL | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO N&N | TRANSMITTED TO F&S AND N&N | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-------------------------------|-------------------|
| T. BLEJWAS | 0 | 0 | 3 | 3 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|---------------|----------|---------------------------|--------------|--------------------------------|-------------|
| SAIC/TARC | Civil | T. PYSTO | CI-170 | T.CI.THP.001 | JS-025-ESF-C46 H&M | T |
| SAIC/TARC | Civil | T. PYSTO | CI-120 | T.CI.THP.002 | JS-025-ESF-C41 .B CIVIL | T |
| SAIC/TARC | Civil | T. PYSTO | CI-117 | T.CI.THP.003 | JS-025-ESF-C41 | T |
| SAIC/TARC | Civil | T. PYSTO | CI-118 | T.CI.THP.004 | JS-025-ESF-C41 | T |
| SAIC/TARC | Civil | T. PYSTO | CI-119 | T.CI.THP.005 | JS-025-ESF-C41 .B | T |
| SAIC/TARC | Electrical | T. PYSTO | EL-058 | T.EL.THP.006 | JS-025-ESF-W4 | T |
| SAIC/TARC | Civil | T. PYSTO | CI-173 | T.CI.THP.007 | SECTION 02110 PAGE 3, 3.05A | T |
| SAIC/TARC | Civil | T. PYSTO | CI-183 | T.CI.THP.008 | SECTION 02211 PAGE 3, 3.01A | T |
| SAIC/TARC | Civil | T. PYSTO | CI-186 | T.CI.THP.009 | SECTION 02211 PAGE 3 3.02B | T |
| SAIC/TARC | Civil | T. PYSTO | CI-219 | T.CI.THP.010 | SECTION 02615 PAGE 12 3.08A | T |
| SAIC/TARC | Civil | T. PYSTO | CI-230 | T.CI.THP.011 | SECTION 02731 PAGE 5 3.05A | T |
| SAIC/TARC | Civil | T. PYSTO | CI-192 | T.CI.THP.012 | SECTION 02222 PAGE 4 302.F | T |
| SAIC/TARC | Civil | T. PYSTO | CI-200 | T.CI.THP.013 | SECTION 02223 PAGE 4 3.03J | T |
| SAIC/TARC | Civil | T. PYSTO | CI-235 | T.CI.THP.014 | SECTION 02831 PART 1, 1.03B | T |
| SAIC/TARC | Civil | T. PYSTO | CI-234 | T.CI.THP.015 | SECTION 02831 PAGE 8, 3.04B.1. | T |
| SAIC/TARC | Shaft | T. PYSTO | SH-143 | T.SH.THP.016 | FS-SP-0202 PAGE 5, 3.6 | T |
| SAIC/TARC | Shaft | T. PYSTO | SH-136 | T.SH.THP.017 | FS-SP-0201 PAGE 3, 3.1.5 | T |
| SAIC/TARC | Shaft | T. PYSTO | SH-148 | T.SH.THP.018 | FS-SP-0203 PAGE 5, 3.8 | T |
| SAIC/TARC | Mining | T. PYSTO | MI-141 | T.MI.THP.019 | FS-SP-1103 1.3 | T |
| SAIC/TARC | Civil | T. PYSTO | CI-036 | T.CI.THP.020 | JS-025-ESF-C17 B, A-9 | T |
| SAIC/TARC | Civil | T. PYSTO | CI-097 | T.CI.THP.021 | JS-025-ESF-C38 .B | T |
| IC/TARC | Civil | T. PYSTO | CI-109 | T.CI.THP.022 | JS-025-ESF-C39 B C.6 | T |
| SAIC/TARC | Civil | T. PYSTO | CI-156 | T.CI.THP.023 | JS-025-ESF-C44 B | T |
| SAIC/TARC | Architectural | T. PYSTO | AR-007 | T.AR.THP.024 | JS-025-6000-A1 B | T |
| SAIC/TARC | Civil | T. PYSTO | CI-015 | T.CI.THP.025 | FS-GA-0013 | T |
| SAIC/TARC | Civil | T. PYSTO | CI-111 | T.CI.THP.027 | JS-025-ESF-C39 D, 8-10 | T |
| SAIC/TARC | Civil | T. PYSTO | CI-110 | T.CI.THP.028 | JS-025-ESF-C39 B, D 8-10 | T |
| SAIC/TARC | Electrical | T. PYSTO | EL-037 | T.EL.THP.029 | JS-025-ESF-E6 | T |
| SAIC/TARC | General | T. PYSTO | GE-025 | T.GE.THP.030 | GENERAL | T |
| SAIC/TARC | Civil | T. PYSTO | CI-062 | T.CI.THP.031 | FS-GA-0031 | T |
| SAIC/TARC | Civil | T. PYSTO | CI-037 | T.CI.THP.032 | JS-025-ESF-C17 B, C-7 | T |
| SAIC/TARC | Civil | T. PYSTO | CI-218 | T.CI.THP.033 | SECTION 02615 3.08 B | T |
| SAIC/TARC | Civil | T. PYSTO | CI-182 | T.CI.THP.034 | SECTION 02211 2.01 | T |
| SAIC/TARC | Mechanical | T. PYSTO | ME-006 | T.ME.THP.035 | JS-025-ESF-FP3 .B | T |
| SAIC/TARC | Architectural | T. PYSTO | AR-015 | T.AR.THP.036 | JS-025-6001-A2 .A | T |
| SAIC/TARC | Civil | T. PYSTO | CI-224 | T.CI.THP.037 | SECTION 02730 3.13 .D P.9 | T |
| SAIC/TARC | Civil | T. PYSTO | CI-179 | T.CI.THP.038 | SECTION 02202 1.06 P.2 | T |
| SAIC/TARC | General | T. PYSTO | GE-004 | T.GE.THP.039 | GENERAL | T |
| SAIC/TARC | Civil | T. PYSTO | CI-176 | T.CI.THP.039 | SECTION 02110 1.01 | T |
| SAIC/TARC | Electrical | T. PYSTO | EL-038 | T.EL.THP.040 | JS-025-ESF-E6 .B D-7 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&M | TRANSMITTED TO F&S AND H&M | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| T. PYSTO | 6 | 32 | 2 | 40 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------------|-----------|---------------------------|--------------|------------------------------|-------------|
| LOS ALAMOS | Electrical | T. MERSON | EL-053 | A.EL.TJM.001 | JS-025-ESF-W15 .B | T |
| LOS ALAMOS | Mining | T. MERSON | MI-019 | A.MI.TJM.002 | FS-GA-0160 | T |
| LOS ALAMOS | Piping & Instrum | T. MERSON | PI-002 | A.PI.TJM.003 | FS-GA-0220 | T |
| LOS ALAMOS | Piping & Instrum | T. MERSON | PI-005 | A.PI.TJM.004 | FS-GA-0220 | T |
| LOS ALAMOS | Mechanical | T. MERSON | ME-016 | A.ME.TJM.005 | FS-SP-1507 | T |
| LOS ALAMOS | Civil | T. MERSON | CI-172 | A.CI.TJM.006 | SECTION 02110 .A AND 02211.A | T |
| LOS ALAMOS | Civil | T. MERSON | CI-015 | A.CI.TJM.007 | JS-025-ESF-C4 | T |
| LOS ALAMOS | Architectural | T. MERSON | AR-037 | A.AR.TJM.008 | JS-025-6007-A1 .B | T |
| LOS ALAMOS | Electrical | T. MERSON | EL-026 | A.EL.TJM.009 | JS-025-ESF-E2 AND E4.A | T |
| LOS ALAMOS | Electrical | T. MERSON | EL-016 | A.EL.TJM.010 | FS-GA-0207 | T |
| LOS ALAMOS | Electrical | T. MERSON | EL-056 | A.EL.TJM.011 | JS-025-ESF-W3 B | T |
| LOS ALAMOS | Electrical | T. MERSON | EL-011 | A.EL.TJM.012 | JS-025-6006-E1 B | T |
| LOS ALAMOS | Electrical | T. MERSON | EL-013 | A.EL.TJM.013 | JS-025-6006-W1 B | T |
| LOS ALAMOS | Mechanical | T. MERSON | ME-069 | A.ME.TJM.014 | JS-025-6006-FP1 .B | T |
| LOS ALAMOS | Architectural | T. MERSON | AR-034 | A.AR.TJM.015 | JS-025-6006-A2 | T |
| LOS ALAMOS | Electrical | T. MERSON | EL-033 | A.EL.TJM.016 | JS-025-ESF-E5 | T |
| LOS ALAMOS | General | T. MERSON | GE-001 | A.GE.TJM.017 | GENERAL | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|-----------|-----------------------|-----------------------|-------------------------------|-------------------|
| T. MERSON | 5 | 11 | 1 | 17 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITI |
|--------------|------------|------------|---------------------------|--------------|--------------------|-----------|
| USGS | General | T. LIPPERT | GE-011 | G.GE.TLL.001 | GENERAL | T |
| USGS | Shaft | T. LIPPERT | SH-029 | G.SH.TLL.002 | FS-GA-0054 | D1 |
| USGS | Shaft | T. LIPPERT | SH-044 | G.SH.TLL.003 | FS-GA-0058 | D4 |
| USGS | Mining | T. LIPPERT | MI-043 | G.MI.TLL.004 | FS-GA-0163 | A5, A7 |
| USGS | Shaft | T. LIPPERT | SH-137 | G.SH.TLL.005 | FS-SP-0201 | |
| USGS | Shaft | T. LIPPERT | SH-156 | G.SH.TLL.006 | FS-SP-1407 | |
| USGS | Shaft | T. LIPPERT | SH-160 | G.SH.TLL.007 | FS-SP-1416 | |
| USGS | Shaft | T. LIPPERT | SH-046 | G.SH.TLL.008 | FS-GA-0058 | D4 |
| USGS | Shaft | T. LIPPERT | SH-027 | G.SH.TLL.009 | FS-GA-0054 | A5 |
| USGS | Shaft | T. LIPPERT | SH-050 | G.SH.TLL.010 | FS-GA-0059 | C2 |
| USGS | Shaft | T. LIPPERT | SH-088 | G.SH.TLL.011 | FS-GA-0072 | B7 |
| USGS | Shaft | T. LIPPERT | SH-043 | G.SH.TLL.012 | FS-GA-0058 | C7 |
| USGS | Shaft | T. LIPPERT | SH-042 | G.SH.TLL.013 | FS-GA-0058 | C6 |
| USGS | Shaft | T. LIPPERT | SH-087 | G.SH.TLL.014 | FS-GA-0072 | |
| USGS | Shaft | T. LIPPERT | SH-091 | G.SH.TLL.015 | FS-GA-0072 | B3 |
| USGS | Shaft | T. LIPPERT | SH-097 | G.SH.TLL.016 | FS-GA-0085 | B6 |
| USGS | Shaft | T. LIPPERT | SH-102 | G.SH.TLL.017 | FS-GA-0091 | B6 |
| USGS | Mining | T. LIPPERT | MI-004 | G.MI.TLL.018 | FS-GA-0150 | A4 |
| USGS | Shaft | T. LIPPERT | SH-089 | G.SH.TLL.019 | FS-GA-0072 | B8 |
| USGS | Shaft | T. LIPPERT | SH-028 | G.SH.TLL.020 | FS-GA-0054 | A5 |
| USGS | Shaft | T. LIPPERT | SH-103 | G.SH.TLL.021 | FS-GA-0095 | C5 |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&M | TRANSMITTED TO F&S AND H&M | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-------------------------------|-------------------|
| T. LIPPERT | 20 | 0 | 1 | 21 |

9/26/88

Page 1

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | DISPOSITION |
|--------------|------------|----------|---------------------------|--------------|--------------------|-------------|
| NTOS | Electrical | W. BOSS | EL-050 | E.EL.WAB.001 | JS-025-ESF-W12 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| W. BOSS | 0 | 1 | 0 | 1 |

COMMENT TRACKING SYSTEM
SORTED BY REVIEWER COMMENT NUMBER

| ORGANIZATION | DISCIPLINE | REVIEWER | RESOLUTION FORM ITEM # | COMMENT # | DRAWING OR SPEC | STATUS |
|--------------|------------------|----------|---------------------------|--------------|--------------------|--------|
| REECO | General | W. GRAMS | GE-016 | R.GE.WHG.001 | GENERAL | T |
| REECO | Civil | W. GRAMS | CI-002 | R.CI.WHG.002 | FS-GA-0011 | T |
| REECO | Civil | W. GRAMS | CI-036 | R.CI.WHG.003 | FS-GA-0016 | T |
| REECO | Civil | W. GRAMS | CI-047 | R.CI.WHG.004 | FS-GA-0023 | T |
| REECO | Civil | W. GRAMS | CI-070 | R.CI.WHG.005 | FS-GA-0034 | T |
| REECO | Civil | W. GRAMS | CI-073 | R.CI.WHG.006 | FS-GA-0040 | T |
| REECO | Civil | W. GRAMS | CI-076 | R.CI.WHG.007 | FS-GA-0041 | T |
| REECO | Shaft | W. GRAMS | SH-024 | R.SH.WHG.008 | FS-GA-0050 | T |
| REECO | Shaft | W. GRAMS | SH-033 | R.SH.WHG.009 | FS-GA-0056 | T |
| REECO | Shaft | W. GRAMS | SH-054 | R.SH.WHG.010 | FS-GA-0059 | T |
| | | | | | SHAFT | T |
| | | | | | CONVERGENCE | |
| REECO | Shaft | W. GRAMS | SH-066 | R.SH.WHG.011 | FS-GA-0062 | T |
| REECO | Shaft | W. GRAMS | SH-061 | R.SH.WHG.012 | FS-GA-0062 | T |
| REECO | Shaft | W. GRAMS | SH-071 | R.SH.WHG.013 | FS-GA-0063 | T |
| REECO | Shaft | W. GRAMS | SH-076 | R.SH.WHG.014 | FS-GA-0072 | T |
| REECO | Shaft | W. GRAMS | SH-113 | R.SH.WHG.015 | FS-GA-0102 | T |
| REECO | Shaft | W. GRAMS | SH-112 | R.SH.WHG.016 | FS-GA-0102 | T |
| REECO | Mining | W. GRAMS | MI-011 | R.MI.WHG.017 | FS-GA-0160 | T |
| REECO | Mining | W. GRAMS | MI-015 | R.MI.WHG.018 | FS-GA-0160 | T |
| REECO | Mining | W. GRAMS | MI-032 | R.MI.WHG.019 | FS-GA-0161 | T |
| REECO | Mining | W. GRAMS | MI-036 | R.MI.WHG.020 | FS-GA-0162 | T |
| REECO | Mining | W. GRAMS | MI-040 | R.MI.WHG.021 | FS-GA-0163 | T |
| REECO | Mining | W. GRAMS | MI-055 | R.MI.WHG.022 | FS-GA-0166 | T |
| REECO | Mining | W. GRAMS | MI-068 | R.MI.WHG.023 | FS-GA-0171 | T |
| REECO | Mining | W. GRAMS | MI-073 | R.MI.WHG.024 | FS-GA-0194 | T |
| REECO | Piping & Instrum | W. GRAMS | PI-004 | R.PI.WHG.025 | FS-GA-0220 | |
| REECO | Ventilation | W. GRAMS | VE-004 | R.VE.WHG.026 | FS-GA-0227 | T |
| REECO | Mining | W. GRAMS | MI-082 | R.MI.WHG.027 | FS-SP-0204 | T |
| REECO | Mining | W. GRAMS | MI-077 | R.MI.WHG.028 | FS-SP-0204 | T |
| REECO | Mining | W. GRAMS | MI-088 | R.MI.WHG.029 | FS-SP-0204 | T |
| REECO | Mining | W. GRAMS | MI-115 | R.MI.WHG.030 | FS-SP-0205 | T |
| REECO | Shaft | W. GRAMS | SH-001 | R.SH.WHG.031 | FS-GA-0050 | T |
| REECO | Shaft | W. GRAMS | SH-031 | R.SH.WHG.032 | FS-GA-0056 | T |
| REECO | Shaft | W. GRAMS | SH-072 | R.SH.WHG.033 | FS-GA-0063 | T |
| REECO | Mining | W. GRAMS | MI-012 | R.MI.WHG.034 | FS-GA-0160 | T |
| REECO | Mining | W. GRAMS | MI-014 | R.MI.WHG.035 | FS-GA-0160 | T |
| REECO | Mining | W. GRAMS | MI-013 | R.MI.WHG.036 | FS-GA-0160 | T |
| REECO | Mining | W. GRAMS | MI-056 | R.MI.WHG.037 | FS-GA-0166 | T |
| REECO | Mining | W. GRAMS | MI-057 | R.MI.WHG.038 | FS-GA-0166 | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S AND H&N | TOTAL COMMENTS |
|----------|-----------------------|-----------------------|-------------------------------|-------------------|
| W. GRAMS | 37 | 0 | 1 | 38 |

COMMENT TRACKING SYSTEM

SORTED BY REVIEWER COMMENT NUMBER

| ORGAN. | DISCIPLINE | REVIEWER | RESOLUTION FORM/ITEM # | COMMENT # | DRAWING OR SPEC | DISP. |
|--------|------------|------------|---------------------------|--------------|--------------------|-------|
| DOE/HQ | General * | D. Stucker | GE-052 | Q.GE.SD.001* | | T |
| DOE/HQ | General * | D. Stucker | GE-053 | Q.GE.SD.002* | | T |
| DOE/HQ | General * | D. Stucker | GE-054 | Q.GE.SD.003* | | T |
| DOE/HQ | General * | D. Stucker | GE-055 | Q.GE.SD.004* | | T |
| DOE/HQ | General * | D. Stucker | GE-056 | Q.GE.SD.005* | | T |
| DOE/HQ | General * | D. Stucker | GE-057 | Q.GE.SD.006* | | T |
| DOE/HQ | General * | D. Stucker | GE-058 | Q.GE.SD.007* | | T |
| DOE/HQ | General * | D. Stucker | GE-059 | Q.GE.SD.008* | | T |
| DOE/HQ | General * | D. Stucker | GE-060 | Q.GE.SD.009* | | T |

| REVIEWER | TRANSMITTED TO F&S | TRANSMITTED TO H&N | TRANSMITTED TO F&S & H&N | TOTAL COMMENTS |
|------------|-----------------------|-----------------------|-----------------------------|-------------------|
| D. Stucker | 0 | 0 | 9 | 9 |