Rocky Flats Site Profile Review:
Matrix of priority Issues potentially relevant to SEC petition review
Prepared by ABRWH Workgroup, Jan 8, 2007
(See Oct 31, 2006 matrix for previous action items)
Note: Additional issues may arise as a result the review of the petition and amendments and NIOSHs evaluation report.

Comment Number	Issue Description	Actions (Aug 31, 2006)
2	The approaches regarding solubility need to be reviewed, particularly for Type "S" or "super-S" plutonium compounds whose high insolubility may lead to more exposure to gastrointestinal and respiratory tract organs. The sensitivity of the bioassay methods was not adequate to detect incidental intakes of insoluble compounds, and also the bioassay methods applied at that time were not appropriate.	1a. NIOSH provided TIB-0049 and all supporting case data and analysis files related to TIB-0049. SC&A has completed review and will include in SEC evaluation report (SEC #0030) 1b. NIOSH provided all data and analysis related to USTUR autopsy cases used in support of the Super S plutonium approach. 1c. NIOSH provided procedure for addressing GI tract doses from super S plutonium exposures. SC&A to review and incorporate in review of evaluation report (SEC #0030). 1d. NIOSH to provide identifiers for all design cases and NIOSH to provide case data for HAN-1 case. 1e. NIOSH provided identifiers for 25 cases (cases with highest lung burdens) involved in 1965 fire. SC&A compared these cases with cases used in OTIB-0049. 1f. NIOSH will provide HIS-20 with identifiers (name, SSN, and company). SC&A reviewed several of the individuals (25 cases in 1e above) and found incomplete data in electronic data. SC&A requested the hard copy radiation files for these individuals. NIOSH indicated that they don't have these files but would request them from DOE.

4	Uncertainties are not addressed in the TBD regarding the ^{241}Am assay of plutonium processed at RFP and how lung counting was calibrated to these values, especially in view of different ^{241}Am proportions at different processing steps and different plutonium ages.	1. NIOSH believes approach was adequately described in the site profile. Upon further explanation of approach and presentation of additional information regarding RF practices on adjusting plutonium isotopic ratios and Am in-growth, SC&A agrees that the methods and ratios cited may be appropriate. NIOSH provided some information to support the assertions regarding the practices for adjusting plutonium isotopic ratios and Americium in-growth to the Board and SC&A for review. 2. NIOSH to outline approach for determining internal dose from Americium (especially important for Americium separation operations prior to implementation of lung counting program). 3. Upon further research NIOSH indicated that Americium separation operations were not in place prior to 1963 and post 1963 workers involved in Americium separation operations would have had Americium specific bioassay testing. ('other radionuclides' are discussed in finding #35) 4. NIOSH provided report on "other" radionuclides at RFP which included discussion of Americium-241. SC&A provided a review of this report. NIOSH provided follow-up information on other radionuclide use (see item 29 and 35 below)
6	Interpretation of NTA film data and correction of recorded dose for workers who were not included in the NDRP is not evident.	1. NIOSH has provided (on "O"drive) the NDRP data and OTIB-0050. SC&A will review and provide comments. SC&A has raised a number of questions sent to NIOSH on Feb. 21, 2006 after a brief look at the NDRP report. Some of these questions are still outstanding, such as the justification for using the NTA film calibration factor for glass track dosimeters in view of the problems with the latter and using one or two neutron calibration spectra to cover all neutron energy spectra in the varied workplaces at RFP. SC&A has indicated (7/26/06 mtg) that they are satisfied with NIOSHs explanation of the calibration factor. NIOSH will provide to SC&A for review the details for early neutron dose data used to construct Table 7-1 in OTIB-0058 per Ron Buchanan review comments (5/26/06). NIOSH indicated this has been included in draft revision of TIB-0058. NIOSH provided report outlining the QA of the NDRP database. (10/4/06) See also, item #23.

7	There is a need to use neutron-to-photon ratios and/or film/TLD comparisons to correctly determine past neutron doses. Workers were exposed to neutrons in the NTA film period at lower energy levels than the dosimeter is capable of measuring. It is important to generate correction factors for under-monitored workers or for monitored-worker missed dose. This is especially important for non-Pu workers covered by the NDRP Report, and workers involved with the Pu tetraflouride and Pu machining operations during the early period.	1. NIOSH provided Plutonium tetraflouride calibration information supporting reference documents to the Board and SC&A
9	The site profile, while incorporating methodologies for assignment of missed dose, has not adequately bound exposure conditions, compensated for calibration errors and technical deficiencies, and addressed possible data integrity issues, including possible zero entries in the dose records when badges were not returned, all of which may contribute to missed dose.	1. NIOSH has provided the NDRP data (available on the "O" drive). NIOSH has developed OTIB-0050 which describes how to use NDRP data for individual DRs. SC&A reviewed and NIOSH responded. No further actions. 2. NIOSH continues to pursue obtaining the Job-Exposure Matrix developed by Dr. James Ruttenber however, NIOSH believes this is not an SEC petition issue. 3. NIOSH provided analysis regarding the 'completeness of external exposure data'. SC&A will review and provide comments in the review of the SEC petition evaluation report (SEC #0030). In the interim, SC&A provided an analysis of remaining issues (drafted by Ron Buchanan, SC&A). SC&A has concerns about potential gaps in 1969 data and number of records with 'zero' dose in 1969 and 1970. NIOSH indicated that they have reviewed the records of 600 claimants and determined that 138 have records which appear to be incomplete for 1969. NIOSH will provide the following documents related to the 1969 fire: 1) log book for the time of the fire, 2) Incident report(s) for the fire. NIOSH has retrieved raw records for the time period and is in the process of comparing these with the database. SC&A to provide a logbook from the time of the fire (being transmitted). NIOSH posted the individuals lung counted after the 69 fire on the O drive. NIOSH and SC&A to review individual radiation files of individuals to determine whether records were included.

		NIOSH provided a report on the 1969-1970 missing data issue, 10/30/06. SC&A in the process of reviewing this report. 4. NIOSH will provide description of co-worker model to be used and provide the co-worker database and/or analysis files. NIOSH indicated that few cases will rely on use of co-worker data. SCA will review and comment on approach in the review of the evaluation report (SEC #0030). 5. NIOSH indicated that it is not clear that 'the practice of recording zeros when badges were not turned in .." was consistent across all time periods". NIOSH will investigate practice over time and provide an assessment to the Board and SC&A. The petition claims that "[i]nconsistent procedures for monitoring and dose assessment" were used. The petition also asserts that after neutron monitoring was introduced, the readings were found to be "in error" until the 1970s and that dosimeter chips were sometimes "destroyed or lost during processing." (p. 13) These allegations should be addressed in NIOSHs petition evaluation. Further petitioners claimed during the Feb 27 workgroup meeting that there were instances of not wearing badges because of hazard pay incentives. NIOSH has provided an approach for handling these type of instances. SC&A will review as it applies to the SEC petition in question. NIOSH has sent a letter to the petitioners requesting more specific information and are waiting for a reply. The petitioners indicated that a letter was ready to be sent to NIOSH. **(Items listed here have been listed separately in the matrix (see new items #12- 28)** 6. NIOSH needs to research this question further (inappropriate low-energy photon detector correction factor that may have been used as stated in 1993 DNFSB report). NIOSH provided a response indicating that the response of the Panasonic dosimeter used at Rocky Flats was based on the response to several spectra and was not affected by the change in DOELAP testing program. No further action required. 7. NIOSH will determine the extent and nature of the 'criminal investigations' and/or 'security investigations' mentioned by the petitioner during the workgroup meeting. NIOSH sent a letter to petitioners asking for more specifics. NIOSH received a letter from petitioner and provided a written response to several items (document titled "Status of Rocky Flats NIOSH Action Items" dated April 20, 2006). NIOSH found nothing along those lines at this point.

		8. NIOSH / ORAU to demonstrate reliability of bioassay and external database data for the compensation program. NIOSH reported that Kaiser Hill did QC external dose data against the database when assembling individual claimants data. No roll-up report of this QC effort. NIOSH provided additional analysis within the SEC evaluation report and within supplemental materials. NIOSH compared records from 38 claimant files with electronic database and determined that there was good agreement (see document titled "Status of Rocky Flats NIOSH Action Items" dated April 20, 2006). NIOSH noted that the claimant file would have bioassay card data for data prior to 1969. Post 1969 the claimant file would have database printouts (HSDS or HIS20 database data) rather than bioassay card data. NIOSH is in the process of retrieving urinalysis logs for comparison to database and will provide a methodology for sampling from the raw records for comparison to the database. NIOSH provided urinalysis logs on the O drive and NIOSH provided an analysis of all log books compared to individual radiation files. NIOSH provided report on HIS-20 lung count data (8/23/06) which concluded that there are substantial problems with HIS-20 lung count data. NIOSH provided report comparing HIS-20 urine data with CER urine data which concluded that there were large discrepancies but pointed out that the dose reconstruction effort, for the vast majority of the cases, will not rely on these database data (10/6/06).
10 (formerly numbered New Issue #1)	Only "roll-up" penetrating doses exist for individuals prior to 1976. It is not clear how the neutron and photon doses will be determined from the roll-up dose.	NIOSH proposes to use the approach used in NDRP and outlined in OTIB-0050 for pre-1971 determinations and for 1971-1976 a proposed neutron to photon approach as outlined in OTIB-0050 will be used. SC&A will review these proposed approaches and provide comments. No further action required.
11 (formerly numbered New Issue #2)	A group of results from July thru October 1984 appear to indicate a reporting problem with the dosimetry algorithm used to calculate dose equivalents	NIOSH indicated that the problem with the algorithm resulted in recording neutron doses, evaluated as zeros, with higher doses and therefore concludes that it would result in a claimant favorable determination. No further action necessary.

12	Zero entries in dose record when badges were not returned (Matrix comment number 9) This issue is divided into two periods: • Pre-1964, when badges were not issued to all workers • 1964 and after when badges were issued to all workers The dose record may also contain blanks or "no data available." Methods to separate these kinds of entries or blanks from zeros that denote a value below the LoD are needed.	NIOSH will track specific 'no data available' cases and will review database to determine whether there is a systemic problem. NIOSH attempted some statistical analysis to look at potential systemic problem using claimant data however, due to the nature of the data along with other factors this analysis was inconclusive. SC&A has conducted interviews with some individuals at the site and has recovered some materials (log books, etc.) pertinent to the topic. SC&A provided a report outlining some of these data integrity issues (see document titled "Interim Evaluation of Data Reliability Issues: Needed Document Retrieval and Evaluation" dated April 19, 2006). Follow-up actions from this report are included in matrix items 30, 31, and 32 at the bottom of this matrix. NIOSH has obtained data worksheets post 1973 and is in the process of comparing 'no data available entries' with the HIS-20 database. NIOSH provided analysis in file 'no current data available.pdf' on 8/25/06. SC&A reviewed 12 individual claim files for completeness. SC&A provided report (10/24/06). SC&A to draft sampling approach to be used in sampling from ALL claimant radiation files up to 1993 (D&D era); SC&A and NIOSH to review proposed approach and cases to assure goals of workgroup will be met. It was agreed that radiation files for 20 'production' workers would be reviewed and additional randomly selected cases (less than or equal to 20 additional cases). SC&A to provide draft report to Emily Howell for privacy act review.
13	Chips fell out of TLDs and readings were not included in worker records. Allegation in SEC petition.	These situations were probably not investigated. NIOSH determined that in the mid 80's there was a procedure but only to take problems to a supervisor but noted that the 'loose' chips concern could have only been during the period of 1969-1983 when those types of badges were used. SC&A provided the badge numbers to NIOSH for follow-up comparison against HIS-20 database. NIOSH provided response in file 'dosimetry program log analysis 8-25-06.xls'. SC&A to review and include in overall evaluation report.
14	Hair and body oils on TLD chips cause inaccurate readings (SEC Part a, p. 45)	Oil or dirt contamination on a crystal could burn as the crystal was heated and give an artificially-high result for that crystal. This result, when compared with the readings from the other crystals in the dosimeter (Figure 1), would have indicated whether the dosimeter had been exposed to contamination. In this case, the result from that crystal would be useless. A dose could be estimated from the readings from the remaining crystals. Anomalous TLD results were investigated using, and the procedures for doing so were formalized in 4-J88-RDE-0053, "TLD Data Investigation and Abbreviated External Dose

		Reconstruction" and 4-J98-RDE-0071, "Extended External Dose Reconstruction. NIOSH will determine if a procedure similar to the one mentioned above was in place throughout the history of the site and NIOSH will provide the procedures. NIOSH indicated that the type of badge which required handling of the chips was used from 1969-1983. NIOSH provided a 1983 procedure which discussed appropriate handling No further action required. SC&A to review and include in overall evaluation report.
15	Deliberately false entries were made into dose records There is a charge of deliberate falsification of data. For instance, a worker alleges that his supervisor "would advise the dosimeter worker that the dose shown was too high to be possibly correct," and the worker was advised to change or delete the reading. (SEC petition, Part a, p. 57.). Further in Part b, p. 501, a worker alleges that zeros were entered into dose records when the TLD reader failed.	NIOSH is not currently aware of any findings of systematic falsification of data. This very serious charge has been made by the petitioner at previous working group meetings and, in a letter dated March 15, 2006, (Figure 2) NIOSH followed up with the petitioner and requested any supporting investigation reports that could be provided. NIOSH received a letter from petitioner and provided a written response to several items (document titled "Status of Rocky Flats NIOSH Action Items" dated April 20, 2006). NOTE: This item is duplicate to comment 9, action item 7 above. NIOSH will follow-up by reviewing dosimetry log books (representative number) to check for indications of abnormal findings and compare to the database. NIOSH provided a report on review of log books. SC&A to review and include in overall evaluation report.
16	Unauthorized work practices The petition provides examples of unauthorized work practices (e.g., p. 54, Part a)	While such practices constitute a regulatory compliance violation, no evidence is provided that such occurrences would prevent dose reconstruction of sufficient accuracy. No further action required. SC&A to review and include in overall evaluation report.
17	Inappropriate subtraction of background in badges hung in the hallway of a work area (alleged in SEC petition)	Approximately 18 boxes of external dosimetry program records were reviewed. These records included weekly and monthly status reports from the 1950s, 1960s and 1970s, and some technical documents generated during that period. Approximately 500 pages of documents were identified as potentially relevant to this issue. No evidence of an identified high background problem was found. In the worst case, such a situation would necessitate an adjustment to the ambient environmental dose NIOSH assigns during dose reconstruction. It would not preclude accurate dose reconstruction. Therefore NIOSH contends that this issue does not have SEC implications. No further action required. SC&A to review and include in overall evaluation report.

18	Workers frequently did not wear badges in production areas and did not report non-use of badge (Petition, Part a, p. 53) This raises a question of how missed dose is to be interpreted.	NIOSH provided preliminary statistical analysis (April 20, 2006 response) (post 1977 data – selected since after 1977 badge data rather than summary quarterly data was included within the database) suggesting that the allegation was not a systemic problem. NIOSH is further evaluating the issue. SC&A provided analysis in response at August workgroup meeting; agreed with NIOSH that flattening of cumulative dose curves not suggestive of intentional non-wearing of badges, but SC&A pointed out statistically small number of workers included; closure not achieved.
19	Badge did not properly record organ dose due to organ being closer to the source than the badge or due to workers wearing the badge under their lead aprons. - Petition provides examples where dose to head and other areas would be much greater than badge reading (p. 53, Part a) - Some workers wore their badge under their lead aprons leading to under-recording of doses to some organs, such as the head, arms, and face. (p. 53, Part a, and p. 23 Part b) Note that these examples are also part of the suggestion that co-worker models for Rocky Flats worker external dose would not be valid.	NIOSH will evaluate the appropriateness of correction factors for various areas and time periods on the site. NIOSH provided response in 6 April 2006 comments page 24-25. Aditionally, NIOSH has developed a TIB on glovebox work and is adding a section in the TBD on correction factors for lead aprons. SC&A agrees with NIOSH that this is not an SEC issue.
20	Missing dose record in areas of high exposure One worker has provided an affidavit saying that an entire year's dose record is missing from a time he worked in an area with radiation dose rates that ranged up to 8 R/hour. He was an **[redacted]** in the Stacker Receiver area of Building 371, and, **[redacted]**, he was not rotated out of the area since he was an **[redacted]** (Part b, p. 32). A worker affidavit including this problem is provided on p. 539 of Part b.	NIOSH tracked back specific data for this individual and believes that the allegation is not supported by the data available in the database (see 5 April 2006 comments, page 29). NIOSH will provide dosimetry data prior to and post the cited time of concern and will provide any incident or investigation data found in the individual's dose record. NIOSH response included in document : "Rocky Flats Plant, Data Integrity Examples," August 25, 2006. SC&A to review and include in overall evaluation report.

21	Bioassays redone when they indicated high exposure There are two examples cited that claim that bioassays were redone or individuals were recounted when the readings were high and subsequent results were declared as having no exposure or false positives (Part a, p. 47 and Part b, p. 32)	If the worker was enrolled in a bioassay program, NIOSH would assign missed dose for bioassay results below the limit of detection, and no evidence has been presented that this practice is insufficient to support sufficiently accurate dose reconstruction. Additionally, NIOSH would not exclude 'false positive' values from bioassay analysis to determine intakes. Identify QA reports and post on O drive if available. NIOSH will follow-up on two examples cited. NIOSH response to specific examples included in document : "Rocky Flats Plant, Data Integrity Examples," August 25, 2006. SC&A to review and include in overall evaluation report.
22	Instances of "no data available" in situations of high exposure There is, for instance, a worker affidavit on p. 35 of Part b stating that "no data available" was entered into the record despite the fact that the film badge was blackened with exposure and the work was in a high exposure area – Am-241 processing. By contrast, there were entries for positive dose at a time when the worker was serving in the military in [**redacted**].	NIOSH is in the process of tracking specific cases. No further action required.
23	Most exposed workers were not monitored for neutrons The petition cites [**redacted**] as saying that until July 1958, the most exposed workers were not monitored for neutrons (Part a, p. 71), raising a question about how the neutron data in the NDRP study are to be used, even if the re-reading of the badges is accepted as sound.	Neutron doses can be calculated based on neutron dosimetry if available, as adjusted in the Neutron Dose Reconstruction Project. If neutron dosimetry is unavailable for an individual, neutron/gamma ratios can be used to calculate neutron doses. The NDRP and ORAU team technical documentation (OTIB-0050) provide time-varying (and location-varying for the NDRP data) neutron to photon ratios. Application of these results to dose reconstruction is documented in OTIB-0050 and the dose reconstruction instructions. The lack of neutron monitoring in the early years does not prevent NIOSH from performing dose reconstructions of sufficient accuracy, and can be dealt with by application of neutron to gamma ratios. NIOSH is not aware of any evidence that would call the soundness of the

		badge re-reads conducted in the NDRP study into question. SCA will review the proposed approach and incorporate in review of SEC evaluation report. NIOSH and SC&A to discuss further with specific attention to whether it is appropriate to use n / p ratios from later time periods for earlier time periods (was source term, operations and shielding comparable during both time periods in question (70s and early 50s). After further discussions with SCA, several additional actions were identified: 1. NIOSH to provide identifiers for HIS-20 database. 2. NIOSH to correct table 7-1 and 7-2 in TIB-0058. This is in revised TIB draft. 3. NIOSH to expand explanation of technical basis for n/p ratios in 50s. This is in revised draft. 4. NIOSH to provide background for NDRP report table 1.1. 5. NIOSH to 'spotcheck' co-worker method by comparing calculated vs. measured neutron doses. 6. NIOSH to provide 'benchmark' n/p ratios in 50s and 70s (per above rationale). 7. NIOSH to possibly consider alternative coworker model.
24	Neutron badge reading was defective Part a, p. 77 shows that zero entries in neutron dose reading dropped from 95.6 percent in 1961 to 56 percent in 1962. So this raises issue of quality of reading badges in the earlier period.	The comment is correct that the observation of the change in zero entries in neutron dose readings between 1961 and 1962 raised questions about reading neutron badges. This observation was the motivation behind the Neutron Dose Reconstruction Project. NIOSH is not aware of any issue which would call into question the re-reading of the neutron badges conducted under the NDRP. No further action required.
25	Post 1991 worker monitoring was not according to criteria for security guards Not all workers were badged in the post-1991 period – only those who were thought to have potential for more than 100 mrem exposure per quarter were badged. The DNFSB found that security guards had the potential for greater exposure but were not monitored. This raises the issue of how dose is to be assigned to post1991 unmonitored workers, if 100 mrem cannot be reliably and consistently regarded as an upper limit missed dose. (Part a, p. 122)	NIOSH believes co-worker approach would address this issue. No further action required.

26	Many incidents were not reported or recorded. The petition claims, "throughout the history of the site it was common practice for incidents in the workplace to be handled at the floor or building level and not reported" (Part a, p. 19). This goes to whether missed internal dose due to unreported and unrecorded incidents causes a problem in regard to adequacy of data for dose reconstruction. Tab E.5 has a detailed example of this and refers to others. Also, p. 139, Part a, cites an unreported incident discovered during a routine bioassay. There are other examples of undocumented exposures in the pages that follow. p. 179; Part a is an example of a worker who was in an explosion involving Pu but there is no film badge.	NIOSH indicated they will estimate dose based on individuals personal data since most workers were on a routine bioassay program. For un-monitored workers, NIOSH contends that exposures from incidents would be covered by co-worker approach. The draft co-worker TIBs, along with the supporting files, have been provided to the Board and SC&A. SC&A reviewed TIB-0038 and had several questions which were discussed in Aug 31 workgroup meeting. NIOSH provided 'white paper' which further detailed the methodology for co-worker model in TIB-0038. SC&A provided a response to the white paper. Dave Allen, NIOSH, in turn, has responded on 10/30 that issue is not with OTIB, but with its application in the TBD.
27	Is data sufficient for estimating ingestion doses? Workers ate in workplaces. One investigation concluded that there was ingestion via inhalation (p. 88 onwards in Part a). How are bioassay data to be interpreted in light of this problem? Also ingestion may have occurred via resuspension. The relevance of this is in the context of deposition of high-fired Pu in large parts of the plant due to the major fires.	This is not an issue since all assessments will be based on bioassay data. No further action necessary.
28	Worker alleges that work-week was logged as 40 hours when it was 45 hours (Part b, p. 24).	NIOSH indicated that they would not be using air sampling to determine intakes and therefore the length of the work week would not affect the dose reconstruction. No further action necessary.

29	Concern over potential exposures to other radionuclides. There were potentials for occupational exposure to tritium (gas, HTO and others), ^{233}U, ^{241}Am, ^{237}Np, ^{244}Cm and ^{210}Po. Purification of ^{241}Am began in 1962 and continued to 1979. ^{233}U processing at RFP was conducted from 1965-1982. Operations involving ^{233}U included metal processing, component manufacturing, material recover, and waste handling. Curium, neptunium, and polonium were used as tracer for the purpose of testing components and were handled in small quantities.	NIOSH response is in SEC petition evaluation report and in 5 April 2006 comments document (page 40). NIOSH provided additional information regarding Thorium and other radionuclides. SC&A provided reponse to the two documents. NIOSH provided interview notes from site expert regarding other radionuclides present over time at the site ([**redacted**] interview). NIOSH later provided interview notes from other site experts interviewed. See also, item #35.
30	Safety Concern Reports identified which indicate concerns with dosimetry results	NIOSH will retrieve safety reports identified by SC&A, provide the reports to the Board and SC&A and attempt to track back to the specific individual. SC&A will independently review reports. NIOSH reviewed the identified reports and found that either the safety reports were not related to the issue of dosimetry results or that the concern cited in the report did not appear to have merit. NIOSH agreed to review the entire database of safety reports and determine if there were other safety reports which should be reviewed. NIOSH has recovered a listing of safety reports (1970 – 2000) and has selected several from the list for review. SC&A will review list and determine if other documents are of interest for review and let NIOSH know which other documents. NIOSH provided review of 34 safety concern reports (identified by NIOSH) and review of 17 additional safety concern reports (identified by SC&A). NIOSH concluded that there were no findings related to SEC issues. SC&A in the process of reviewing NIOSHs report.
31	Concerns were expressed over discrepancies between log books and personnel dosimetry records.	NIOSH will review specific cases identified by SC&A for the 1985-1986 time period. NIOSH will attempt to retrieve similar log books from the film and Harshaw TLD time periods and evaluate the possibility of follow-up from those reports. NIOSH has recovered and scanned a sampling of these log books for review. NIOSH posted the copies of these log books on the O drive. NIOSH provided a report comparing data in log books with individual radiation files

		(10/27/06). SC&A in process of completing review of NIOSH report. See also, item 32, item 34, and item 9-8.
32	Concern that secondary dosimetry logs, contamination control logs, or foreman logs include exposure information (possibly individual specific data) which is inconsistent with individual personnel dosimetry records	NIOSH will attempt to retrieve and review records identified by SC&A, provide copies to the Board and SC&A and evaluate the possibility of follow-up from those report (specifically whether information is available which could be used to determine the reliability of individual dosimetry records). NIOSH has recovered and scanned a sampling of these log books for review. NIOSH has agreed to post the copies of these log books on the O drive. NIOSH will sample from three different types of logs, from the 70s to 2000 for production areas of concern (uranium, production, decon). NIOSH provided a report regarding comparison of log book results and records contained in individual radiation files (10/27/06). SC&A in process of completing review of NIOSH report. See also, item 31, item 34, and item 9-8.
33	Concern was raised as to whether adequate information was available for reconstructing internal doses for D&D workers (including all subcontractors).	NIOSHs believes that the bioassay program during D&D operations did require monitoring which would be sufficient to reconstruct internal doses. NIOSH has agreed to review available data for the D&D workers. NIOSH will review RWII training records and site roster for the D&D time period and compare against HIS-20 to determine if all workers (including subcontractor workers) were in routine bioassay program. NIOSH provided internal dose audit reports from the D&D time period. SC&A provided response in email (from Joe Fitzgerald, 10/24/06). SC&A found that many D&D workers did not leave termination bioassay samples and raised the question of whether internal doses for such individuals could be determined. NIOSH provided analysis indicating that a co-worker model (extension of OTIB-0038) could be used for these workers. This analysis included a comparison of termination bioassay data between representative top-tier contractors and D&D subcontractors which showed no significant difference in dose distribution, thereby substantiating the ability to apply existing RFP dose data to dose estimation for unmonitored D&D workers. SC&A in the process of reviewing this analysis.

34	NIOSH Site profile indicates that urinalysis log books are available for purposes of assessing MDAs. These log books may be useful in assessing the reliability of the electronic data.	NIOSH will attempt to retrieve the log books and outline an approach for using the data for assessing the reliability of the electronic data. NIOSH retrieved and posted some urinalysis log books. NIOSH provided a report assessing data from all types of log books compared with individual radiation files. SC&A in process of completing review of NIOSH report. See also, item 31, item 32, and item 9-8.
35	Concerns raised about whether other radionuclides which were not specifically monitored for were an exposure concern. Radionuclides include: Th-232, U-233, Cm-244, Np-237, Am-241, Pu-238, and Po-210.	1. NIOSH / ORAU researched the materials accounting logs to determine the amounts on site and the locations where the materials would have been used. NIOSH is providing this to the workgroup and SC&A. Radionuclides listed include: Th-232, U-233, Cm-244, Np-237, Pu-238, Pu-242, and Cf-252. SC&A will review source listing. NIOSH will provide technique which will be used to reconstruct doses from each radionuclide, where necessary. NIOSH provided additional information regarding Thorium and other radionuclides. SC&A reviewed and provided a response. SC&A agreed with NIOSHs approach for reconstructing dose for Neptunium and Curium. NIOSH to provide a semi-empirical validation of thorium intake model (bounding intakes estimated using NUREG-1400 approach). NIOSH provided final document outlining approach for Thorium on 12/27/06 (with some clarifications sent by email on 12/29/06) (also listed in item # 29)
36	An allegation was made that records related to occupational exposure were brought to the T-690 trailer and than removed and put in a landfill.	NIOSH has interviewed coworkers in an attempt to investigate this issue. NIOSH will further investigate the issue, including follow-up with the individual that made the allegation. NIOSH provided a report on this issue (9/25/06).

37	Other Specific data integrity concerns (not detailed in above actions), including: • [**Redacted**] case • neutron film blackening	NIOSH has compiled all identified allegations and concerns into "Rocky Flats Plant, Data Integrity Examples," August 25, 2006, which provides specific concerns involved and NIOSH's evaluation of that concern. SC&A has reviewed this compendium (which somewhat overlaps prior data reliability matrix items) and will address in its evaluation report.