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Subject

H-3890-3 - VALIDITY MINERAL REPORTS

1. Explanation of Material Transmitted: This release transmits an entirely revised Handbook Section H-3890-3 - Validity Mineral Reports, previously issued as Interim Guidance under Information Bulletin .
2. Reports Required: None.
3. Materials Superseded: None.
4. Filing Instructions: File immediately after Manual Section 3890 and Handbook H-3890-1.

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none

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H-3890-3

(Total: 26 Sheets)

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Appendix A - Technical Report Outline

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Chapter I - Introduction

A. Purpose. This handbook provides direction and guidance to certified mineral examiners preparing and reviewing mineral reports written to document the validity of mining claims and sites located under the Mining Law of 1872, as amended.

1. Reports. Validity reports are written by certified mineral examiners. BLM certified review mineral examiners technically review and approve validity reports.

2. Other Manuals and Handbooks. This handbook supplements the direction in BLM Manual Sections 3060 and 3891. This handbook should be used in conjunction with the BLM Handbook for Mineral Examiners, H-3890-1, which gives guidance for conducting field examinations of mining claims and sites. Subject to reasonable changes for special cases, the provisions and format of this handbook are required for all validity mineral reports. (See BLM Manual Section 3060.12.)

B. Authority. The authority to administer the Mining Law Administration program is delegated to the Director of the Bureau of Land Management (BLM) by the Secretary of the Interior. BLM's authority in this regard emanates from its succession to the responsibilities of the General Land Office and the Grazing Service, through Reorganization Plan No. 3 of 1946 (60 Stat. 1097) and Reorganization Plan No. 3 of 1950 (64 Stat. 1262). The Departmental Manual states that:

"The Bureau is responsible for mineral and realty activities on all the public lands and for mineral activities on large areas of Federal land managed by other agencies. This includes the administration of the General Mining Laws." (See 135 DM 1.3B and 235 DM 1. A.)

C. Responsibilities and Professionalism

1. Ethics. The mineral examiner's role is to serve as a neutral and objective evaluator of the mining claims or sites examined. The mineral report and its conclusions therefore must reflect a professional and unbiased analysis of the mineral values, economic conditions, and case law that applies to the mining claims and sites examined.

2. Responsibility of the Examiner. The mineral examiner must verify all facts and information concerning the validity of a mining claim or site. The mineral report must document the examiner's verification of all facts and information collected during the field examination and generated through office review and analysis of that information. All information that is included in the mineral report but that does not represent the examiner's own work must be properly identified, cited, and referenced.

D. Writing Style and Standards. For guidance on and presentation of grammar and syntax; accepted style and use of abbreviations, signs, and symbols; and preparation of tables, maps, and illustrations the examiner may refer to H-3890-1 Appendix ID thru IH or Suggestions to Authors of the Reports of the United States Geological Survey, (7th Ed., 1991, or later).

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Chapter I - Introduction

1. Summary, Conclusions, and Recommendations. These must be written in nontechnical language so that the Field Office manager or Deputy State Director can clearly understand the results of the mineral examination.

2. Technical Content. The remainder of the report should contain enough technical detail to document, justify, and support the conclusions and recommendations.

3. Audience. The author should keep in mind that audience for the report may include professionals not specialized in the geosciences, such as land managers, lawyers, judges, and representatives of special interest groups. Complex geological concepts should be explained so that nongeoscientists can understand how these concepts are related to the conclusions.

E. Confidential Information. Confidential information used in the mineral report cannot be released without the written consent of the owner of such information. (See 18 U.S.C. 1905).

1. Claimant Responsibility. Confidential information must be marked by the claimant in a manner that meets the requirements at 43 CFR ' 2.13. The handling and storage of confidential information is covered in BLM Manual Sections 1278 - Access to External Information, and 3060.06 - Mineral Reports - Preparation and Review.

2. Treatment of Confidential Data in the Mineral Report. Confidential information must be summarized in the proper portion of the mineral report. The confidential data and analysis or discussion that refers directly to such data must be attached to the report as a stand-alone, detachable appendix. Confidential information provided by a claimant in support of the discovery may fall into any one or more of the following categories:

- a. Sales and marketing contracts;
- b. Labor contracts;
- c. Individual drill hole logs and assays;
- d. Subsurface geology and structure derived solely from the claimant's drilling and analysis;
- e. Reserve Data. Ore reserve calculations, grades, and tonnages derived solely from the claimant's data; and
- f. Capital Costs. Company-supplied capital costs not published or not supplied to a government agency for an environmental permit.

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Chapter I - Introduction

F. Government Data. Raw data collected by the Federal Government by its own personnel is not confidential unless specifically made so by statute. Geologic maps, cross-sections, ore reserves and ore deposit dimensions derived from government data are considered public information.

1. Non-confidential Data. Certain data or information provided by the claimant or applicant may not be considered confidential under the Freedom of Information Act (FOIA). Such data may include information reported to the Securities and Exchange Commission (SEC) on a company's 10-K form or information provided to other government agencies in acquiring operating permits. Proven reserves, average grades, contained metal content, summary capital, and operating costs are commonly disclosed on a company's SEC 10-K report.

2. Mineral Patents. Mineral reports for mineral patents under Departmental review (209 DM 7); except for portions containing publicly available information, are not releasable under FOIA. Until the Director signs the patent or contest issues, the report is an internal pre-decisional working document and cannot be released.

a. Use of Confidential Data in Reaching a Conclusion. If confidential information is needed to support a conclusion in a mineral report, it must be placed in a separate, detachable appendix to the report. If the report is released for public inspection, the confidential information must be removed. Line-by-line deletion may be needed.

b. Summary of Confidential Information. The report must be written so that it stands alone, and confidential data may have to be summarized. (See BLM Manual Section 1278 and 43 CFR " 2.13 and 2.79.) Information collected by Federal Government personnel for its own use in evaluating public land is usually not considered confidential.

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Chapter II - Components of a Mineral Report

A. Introduction

This chapter contains the recommended subtitles for subjects to be covered, as well as such features as the mineral report cover sheet (BLM Form 3060-1). This format is suggested to ensure coverage of needed information and for adequate documentation of the field examination as well as ease of reading by those lacking technical backgrounds. Appendix A is a sample outline for a validity examination mineral report.

B. Report Sections

1. Title Page. Use BLM Form 3060-1. Computer-generated facsimiles can be used to list multiple authors and to provide space for certification seal imprints. Facsimile cover sheets must list the proper BLM form number in the proper location, and all other information from the standard form must appear on the facsimile.

a. Serial Number. Use the serialized case number assigned to the examination. This number is a unique, alphanumeric designator to show the assigning office, case type, fiscal year, and case number. Generally, the serial case number used will be from the action that triggers the examination. In the absence of a serialized case number, use the lead mining claim recordation number and then add “et al.” after it. Where multiple mining claims are involved, use only the lead file record number or lowest numbered mining claim recordation number and then add “et al.” after it. (All mining claim recordation numbers involved will be listed in the body of the report.)

b. Title. The title should reveal the type of case and mining claims involved and give other unique information. Except for the lead file number, do not list mining claim recordation numbers in the title. They will be tabulated within the body of the report.

c. Lands Involved. This part of the cover sheet should briefly and concisely describe the location of the subject claims or sites and include the following information:

- (1) Legal description: 33 section, lots, tracts, township, range, baseline, and meridian
- (2) Mineral survey number if appropriate
- (3) Surveyed, unsurveyed, or protracted survey
- (4) County and state

d. Author Identification. The names of all authors MUST be printed legibly or typed below the signature line with the author's certification type and number. Each author's position title (from job description) and official duty station must be listed on the title line. Each author must sign and date the final report on the signature line.

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e. Technical Approval. The BLM technical reviewer's name and review certification number must be typed or legibly printed below the signature line. The BLM technical reviewer must sign the final report on the signature line. The technical reviewer's position title (from job description) and official duty station must be listed on the title line. The signature date must be listed and becomes, for reports other than those recommending patent, the report's effective date.

f. Management Acknowledgment. The policy on management acknowledgment is presented in BLM Manual Section 3060.08E. Because the mineral report deals only with the technical geological/mining engineering aspects of a mining claim, the manager does not approve or disapprove its conclusions, recommendations, or contents. Management acknowledgment is not another level of technical review; it merely means that the manager has read the report and understands the report's conclusions and recommendations.

(1). The manager of the office initiating the examination acknowledges the report. The manager's name must be typed or legibly printed above the signature line. The manager's title and duty station must be listed on the title line. The date of management acknowledgment must be entered on the date line.

2. Table of Contents.

a. Major Sections of Report. List the title of all major sections in the report and the beginning page numbers. The table of contents will vary from report to report based on the material covered and the specifics of the examination.

b. Pagination. Each page of a mineral report, including text, illustrations, attachment, maps, and plats must be given a logical, unique, and ascending page number or alphanumeric identifier that can be portrayed in the table of contents.

c. Attachments. List all attachments to the report by title and number by the order in which they appear. Avoid calling this section "Exhibits." In an administrative hearing the mineral report will probably be introduced as "Government Exhibit 2," and confusion can result from referencing "Exhibit II-2A of Government's Exhibit 2."

d. Confidential Information. If confidential information is included in a detachable section of the report, it needs to be identified in the table of contents.

3. Summary, Conclusions, and Recommendations. Write these sections last. Use separate headings for each; summary, conclusions, recommendations. It helps the author and the reader keep the concepts separate. It also makes it easier to respond to a Freedom of Information Act (FOIA) request. These sections should be as short as possible, and must not introduce any information not covered elsewhere in the report. Usually, one or two paragraphs will suffice except in complex cases. Keep discussions of case law to a minimum, and only when they apply

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to required findings. Excessive reference to case law in any section of a report opens the door for a cross-examining attorney to ask questions about the specifics of the cases cited.

a. Summary. This must fully brief the reader in the report's findings without a detailed reading of the report. It must capture the critical aspects of the report. Remember that the audience consists of managers and attorneys. It is necessary to demystify science, engineering, and economics. Clearly summarize what was done in the examination, analysis, and the contents of the report. Make sure that the summary matches the rest of the report. Preparation of a useful summary requires considerable forethought, effort and editing.

b. Conclusions. This section contains the findings based on the examination, sampling, analyses, and economic evaluation. Conclusions must be clear, supported by the report and legally correct. Do not duplicate the summary in this section.

c. Recommendations. These must logically follow from the conclusions and must not introduce new information or raise new issues. If contest is recommended, the contest charges contained in BLM Handbook H-3870-1 should be used.

d. Bad Faith. If a charge of bad faith is to be recommended, the report must present clear and compelling evidence to that end. The content of the report must logically lead the reader to a conclusion that bad faith has taken place.

4. Introduction. Briefly state the purpose of the report. Briefly discuss the history of the case and the field examination. Be sure to include:

a. Key Dates. When the case was assigned, when the claimants were notified, when and where meetings were held with the claimants.

b. People present during the field examination. Include field examiners, claimants, claimant representatives, etc. Include the dates that each person was present. (Tabular format may improve information presentation).

c. Examination Constraints. List and describe any impediments to your examination, including weather conditions (e.g. snow, seasonal constraints), access (e.g. legal constraints, physical constraints), and threats (e.g. physical threats by claimant, surface owner).

d. Case Law. When appropriate, explain and cite an administrative or legal decision that affected your handling of the examination and report.

e. Conferences. Give the scope and extent of any meetings and conferences with the claimant or his representative, opposition groups, and representatives of other government agencies. Be sure to state what, if any, agreements were made during these meetings. Also state that the report's conclusions are limited to the validity of the mining claims for which it was prepared. The conclusions of this report are limited to the action for which the

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report was written and it should not be used for any purpose other than that for which it was originally intended.

5. Land Status and Record Data. This section should provide the land status and mining claim data on record. Land status data includes the legal description of the lands involved and land classification issues such as withdrawals, encumbrances, and special acts of Congress. A partial list of these is included in Table 1.

Table 1 B Partial List of Land Status Conflicts

Withdrawals	Encumbrances
Special acts of Congress National park units National recreation areas National conservation areas Wilderness areas Wild and scenic rivers	Private surface Mineral leases, Material sites and community pits Rights-of-way and easements California Desert Conservation Area patenting clause Areas of critical environmental concern

a. Mining Claim Records. Mining claim record data includes claim names, mining claim historical information, BLM recordation numbers, location dates, and claimants of record (also see 43 CFR subpart 3833). Tabulating the data will usually improve readability. Use exact spelling from location notices, even if the spelling looks wrong. County recordation numbers are sometimes important. List any top filed mining claims and recordation numbers. If a courthouse records search was necessary, fully document the findings.

6. Physical Features and Access. In this section discuss the location of and access routes to the subject lands, the climate and vegetation of the area involved, known cultural resources in the area, and the area's general topography.

a. Location of Claims. To describe the location, give the relationship of the lands involved to towns and cities. The use of a map is helpful. In describing the access to claims, refer to an attached map. If necessary, describe the access as if giving someone directions from a nearby point, i.e. give landmarks and mileage. Describe any impediments to access, including physical, seasonal/climatic, and legal. Refer to an attached topographic map or other suitable method of locating claims on the ground, e.g. aerial photos, mineral survey plats. Explain how you knew you were on the correct claims.

b. Climate. Describe the climate, including precipitation (rain, snow in inches) and temperature ranges. Address seasonal variations, extremes, and yearly averages. Is there net rainfall or net evaporation? This is important in cost analyses of heap leach operations.

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c. Biology. Describe the types of vegetation and wildlife and their distribution. Also describe the availability of trees for mine timber. Pay particular attention to any threatened and endangered species. If there are wildlife or vegetation related seasonal access/operational restrictions describe them. If an EIS or EA has been prepared for this location, cite the relevant portions for further information.

d. Cultural. Discuss the number and type of cultural sites and potential sites that may be affected by the mining operation.

e. Landforms. Describe the topography. Give the high and low elevations near and on the claim group. Describe slopes and relief; landsliding and earth movements; the presence or absence of perennial or intermittent watercourses, springs, wetlands, or flood plains. Give any other pertinent data.

7. Regional Geology and Mining History.

a. Regional Geology. This section focuses on the general geology of the mountain range, mining district, mineral belt, or other limited geologic or geographic area. A geologic discussion covering several states or even a statewide description is normally not appropriate, nor is a discussion of all the geologic events and formations from the Precambrian through the Holocene periods. Limit discussion of geologic time, events, and formations to the area of interest. After reviewing the literature and maps, select those that will best support and build the foundation for the local Geology subsection.

(1). Document your field observations of the significant geologic and tectonic features discussed in the literature. Do not rely solely on quoting or paraphrasing the literature.

(2). In your discussion include a short description of the geologic provinces (two to three sentences); a general description of geologic formations, ages, depositional or replacement environments, tectonic setting, etc. of the area of interest; and a brief description of the mineral deposits and their relationship to the geologic setting.

(3). Prepare suitable graphic data (maps, drawings, charts, panoramic photographs, etc.) for the report that portray the important features of the area. Decide if this data would be most effective placed in the text, or the appendix of the report. Cite references, including yourself, when appropriate, for all maps and cross-sections.

b. Mining History. Describe the area's mining history. Include a discussion of the time period of activities and the minerals or byproducts produced. Summarize the important parts of the history that pertain to the subject mining claims, citing the sources and correlating the history to the mineral property. Keep this summary concise, and use tables so as not to lengthen the text.

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(1). Summarize early mining, milling methods, and other important activities giving production records, amounts, and dollar value. If only dollar amounts exist, estimate quantities using the historic price of the commodity. Give a brief history of the property ownership and important related events. The general discussion of the exploration/mining history needs to build and lead into a discussion of history specific to the property of interest.

8. Geology and Mineralization of the Claims.

a. Geology. Describe the formations involved, their stratigraphic relationships, the structural features, and how they relate to mineral deposits on the claims. This description should rely primarily on personal field observations. The descriptions are used to support mineral operation design, market analysis, and economic evaluation. If there are geologic factors that will impact the engineering aspects of mine design be sure to address them.

b. Geologic Units. Describe in detail the geologic units, their age, the structural and the tectonic features on the claims. Refer to geologic maps, cross-sections, and photographs as much as possible to complement this concise narrative.

(1) Rock Types. Describe the geologic characteristics of each map unit. Describe the nature of unit contacts; age relationship with other units; and distinguishing lithology, including color, composition, texture, and fabric. Features described should help the reader clearly distinguish one unit from another. Focus on those geologic features that are related to the mineralization.

(2) Structure. Describe all the evidence of the structures associated with the mineralization on the claims involved. Include in this description jointing, bedding, faulting, or rock weathering characteristics that control mineral deposition. Document discrepancies between the literature and field observations. Include veins, faults, shear zones, folds, partings, contacts, unconformities, disconformities, nonconformities, bedding, jointing, and cleavage.

(3) Alteration. Discuss weathering, diagenesis, metamorphism, and other physical or chemical changes related to emplacement of the mineral deposit.

(4) Illustrations. Prepare geologic maps, cross-sections, illustrations, and photographs to show the important geologic features of the property. Consider the proper placement of these illustrations. Place large maps and cross-sections in the appendix and photographs and other illustrations in the text. Properly label and reference all illustrations. Select a large enough scale for geologic maps and cross-sections to clearly show important geologic characteristics, physical features, and deposit boundaries and to facilitate volume calculations.

c. Mineral Deposits. Describe mineral deposit relationships observed during the field work. These relationships may include host rock type, texture, age relationships, depositional environment, tectonic and stratigraphic setting, mineralogy, structural control,

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alteration, deposit control, weathering, and geochemical signature. Describe characteristics such as alteration halos, gangue minerals, associated minerals, structure, and other important aspects observed and verified in the field.

(1). Lode Deposits. Discuss the following information: attitude, shape and size of vein, lode, and altered zone. Address the kind, size, and amount of minerals in the wall rock and the mineralized zone. Describe the overburden, including type, extent, compaction, depth, and depth to ground water. Describe the physical characteristics of the deposit, including the engineering characteristics, such as specific gravity, compressive and shear strength, presence of planes of weakness, and porosity.

(2). Placer Deposits. Address the following information: type (e.g. lag, transport, residual); shape; aerial extent; depth to bedrock; thickness of overburden; composition and size range of gravels; presence of clay, or boulders; nature of the bedrock (e.g. natural riffles, joints, potholes, solution cavities); composition; angularity; and texture of rock clasts.

(3). Illustrations. Prepare mineral deposit maps, cross-sections, illustrations, and photographs to show the important features of the mineral deposit. Large maps and cross-sections may be cumbersome and should be placed in the appendix. Photographs and other illustrations may be placed in the text. Label and reference all illustrations. Choose mineral deposit maps and cross-sections of large enough scale to clearly show all important geologic and physical features.

9. Mineral Exploration and Development Work

a. Description of Completed Work. State the size, depth, and extent of workings, and the purpose, if known. Refer to the maps in the attachment section. You may take the maps and diagrams of the workings from the published geologic literature but include your own observations from the field examination. Give proper accreditation to your sources of information. Give the approximate date the work was done, if known, and who did the work. Describe the condition of the workings at the time of the examination.

(1). Access routes. Describe the size, condition, and suitability of all roads for the proposed use. If airstrips, loading docks, or other facilities are involved, describe them in detail and discuss their suitability for the proposed use.

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(2). Mine workings and their condition. For underground workings, describe any shafts, adits, drifts, and stopes. For surface workings, describe any pits, cuts, and trenches. Include in the descriptions dimensions, compass bearings, and distances from some reference point; angle of inclination from horizontal (if appropriate); and materials used in construction.

(3). Drilling. Describe any drilling that has taken place, including number of holes, type (reverse circulation, cable tool, or diamond drill core), and diameter. Discuss the relevance of the drilling with respect to the mineral deposit. Attach plan maps and cross-sections showing drill hole distribution relative to mining claim boundaries and mineral deposits.

(4). Bulk Samples. Discuss any bulk sampling that has taken place and describe the location and the results, if available.

b. Patent Applications. In the case of patent applications, determine if the amount of improvements meets the \$500 per claim requirement for patent. The development work must have been done after the last break in title or relocation. (See 43 CFR ' 3861.2-2.)

10. Mining, Milling, and Related Operations

a. Description of Operations. Describe the mining, milling, processing, and reclamation operations. Use flow sheets as attachments for each of these stages of operations and refer to them in the report. The design process should meet industry standards as described in the Society of Mining, Metallurgy, and Exploration (SME) Mining Engineers Handbook (1992) and Mineral Processing Handbook (1985), or the most recent editions of these handbooks.

(1). If a mine is operating, describe it. Describe the current mining, processing, and reclamation in the plan of operations and consider the existing workings and equipment available to the claimant/operator.

(2). If a mine is operating on the claims but the claimant is proposing significant changes to the plan of operations, describe the proposed operation. Refer to technical (SME) references. Describe the existing and proposed variances in the operation (the claimant's/operator's and/or the mineral examiner's) in mining, processing, and reclamation. Include details of existing and proposed workings, processing flow sheets, and equipment descriptions. If the mineral examiner's plan differs from the claimant's/operator's plan, describe in detail the logic for the differences.

(3). If the claims have no current operation or development but the claimant/operator has a proposal, describe the proposed operation. Refer to technical (SME) references. Describe the proposed operation (the claimant's/operator's and/or the mineral examiner's) by the mining, processing, and reclamation proposed. Include details of proposed

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workings, processing flow sheets, and equipment descriptions. If the mineral examiner's plan differs from the claimant's/operator's plan, describe in detail the logic for the differences.

(4). If no mine is operating or proposed by the claimant, design the most cost-effective mining, processing, and reclamation operation and describe in detail this designed operation.

(5). In all scenarios the mining, processing, and reclamation design must be based on reasonable geotechnical assumptions, such as proper placement of waste dumps and tailings and enough land for the processing plant and ancillary facilities. In all cases, describe your estimate of the most cost-effective operation for the property.

(6). Models may adequately describe mine or mill methods that could be appropriate to the mineral property being examined. If models are used, they must be applicable. Describe the model, and its relevance to the mineral property. Most models can be adjusted to meet local conditions, and doing so will usually be necessary. Describe any adjustments made to the model.

b. Production Equipment and Rates. For each proposal, cover mine production, mill feed rates, and concentration ratios. Be sure to discuss quantity, types, and capacity of equipment. Discuss the ownership and condition of equipment. Make sure that the equipment is suitable for the proposed operation. For example, is the reach of the loader matched with the height of the truck?

c. Facilities Location. Address the location of facilities and the hauling of materials and supplies as well as haul profiles for ore, concentrates, and waste.

d. Ancillary Facilities. Discuss ancillary facilities such as shops, change rooms, offices, power and water sources, and treatment facilities.

e. Reclamation of Project Area. Discuss the reclamation of the project area and the relationship of reclamation to the mining operation. Include such items as location of soil stockpiles and settling ponds. State if the mine's reclamation will be a part of the mining sequence or scheduled after the mine has ceased operation. Ensure the reclamation plan conforms to State and local requirements if permissible under 43 CFR 3809.

11. Field Work, Sampling Procedures and Analytical Work.

a. Field work. Document the field examination. Describe what you did and observed. There is no need to repeat information previously described in the report. It is helpful to work from your field notes to ensure accuracy.

b. Sampling. The purpose of the sampling program is to verify, or establish a basis for estimating, the tonnage and grade of a mineral deposit. Sampling is the most important aspect of the field work. Because it is the basis around which the report's economic evaluation

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is developed, it must be clearly documented. The documentation must show that the sampling was representative of the mineralization existing on the claims. Therefore, a complete account of the sampling techniques and accurate and complete sample descriptions are critical parts of the mineral report.

(1). Sample Collection Procedures. Describe the protocol you followed for collection and handling of samples during the examination. Include details such as sample surface preparation, sample type, security procedures, chain of custody, etc. You can then describe any deviation from this protocol for specific samples in the individual sample descriptions. Describe and justify any variance from the sampling procedures as outlined in BLM Handbook H-3890-1.

(2). Sample Description. Accurately and completely describe each sample and explain the rationale for selecting the sample site e.g. claimant selected, professional judgement. Explain the relationship of the samples to the site-specific geologic setting (e.g. vein, structure, country rock, mineralized zone, alteration zone). Describe the mineralogy/petrology of the sample. List sample dimensions and weight (or volume). Use tables and photographs whenever reasonable to ensure a complete sample description. It is not necessary to include a before and after photograph of each sample in the report.

(3). Sample Distribution. Describe sample distribution and how it relates to the deposit. Use maps, cross-sections, and photographs to explain this information.

c. Analytical Work

(1). Testing Laboratory. Name the laboratory used and explain why you used it.

(2). Sample Preparation. Describe both your and the laboratory's preparation of the samples.

(3). Laboratory Method. Name the laboratory testing method used (atomic absorption, neutron activation, wet chemical, fire assay) and explain why it was used. For unusual analysis programs, such as for many industrial minerals, you will need a more extensive description and background. Explain detection limits of the method used and the limits of error inherent to such a method.

(4). Laboratory Procedures. Explain any unusual or nonstandard procedures or test protocols used. Explain in detail any American Society of Testing Materials (ASTM) tests and the protocols used on samples.

d. Results of Testing and Analysis. Describe the results of the analytical and testing work in a clear and easily understandable manner. It may be desirable to use tables to

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summarize the sample results. If necessary, convert the raw data from laboratory reports and show the results in appropriate units.

12. Economic Evaluation

a. Tonnage and Grade. The methods used to portray grade and tonnage estimates will vary with the type of deposit, deposit model, and sampling techniques. Describe the methods used to estimate grade and tonnage (e.g., underground block, kriging, triangles, polygons, etc.). Fully explain the methods used to define the mining blocks. For clarity, compile tables complete with sample numbers, computations, and units of measure, that show the tonnage and grade for the various blocks.

(1). For alluvial placer deposits, the report must fully describe each appropriate geologic unit, its extent, and its influence on value. The methods used to assign volumes and grades for each unit or subunit must be fully explained, and refer to maps and sections, as appropriate. Tabulate information where it will improve readability.

(2). For industrial mineral deposits, the report must fully describe each appropriate geologic or production unit, its extent, and its influence on value. The methods used to assign volumes and grades for each unit must be fully explained, and refer to maps and sections, as appropriate. Tabulate information where it will improve readability. The report must fully explain the criteria used for determining the characteristics on which grade is based. Reference ASTM standards, market requirements, contract requirements and other necessary factors.

(3). Ensure that all units of measure are shown in computations, tables, and illustrations and that they are compatible with accepted industry practice for the type of deposit and commodity under investigation.

b. Mining Methods. Describe the mining methods evaluated, and select the most cost effective one. Occasionally, several methods may be cost-effective, and they will all need to be considered. Capital and operating costs must be estimated and documented for each. The documentation must include the cost estimating methods used and the sources of the cost information. All cost estimates require that some assumptions be made, and they must be clearly stated. Local health and safety codes should be taken into account.

c. Beneficiation and Refining. Document and itemize costs of beneficiation, transportation, material handling, smelting, leaching, refining and marketing, as appropriate. Capital and operating costs must be documented for each. All cost estimates require that some assumptions be made, and they must be clearly stated.

(1). Do not duplicate costs. For example, when using a suitable cost model that has a cost of overburden removal built in, it is not appropriate to later add a separate line item cost for overburden removal.

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d. Markets and Marketing. Describe markets and marketing. This is necessary even for precious metals, especially placer gold. Marketing and market entry are significant factors for industrial minerals. Few industrial minerals trade in an open market, and most operate in a competitive environment. Many industrial mineral markets are vertically integrated. In such cases, the mineral report must describe the nature of the vertically integrated market and establish the reference point of sale for the mineral commodity that is to be mined. In some cases, a premium is paid for specimen grades of some mineral commodities. This needs to be well documented.

e. Mitigation and Reclamation. Document the necessary environmental and cultural permitting, mitigation, reclamation and rehabilitation costs. Ensure that these costs are only included once. Do not double calculate concurrent reclamation costs already built into the mining plan.

f. Projected Revenues. Document the projected revenues that will result from sale of the mineral commodity. The revenues must reflect the effects of dilution of ores, mill recovery, smelter costs and the potential for fluctuating commodity values. Where the commodity at question is traded on a commodity exchange, the Bureau's commodity pricing policy established in 65 FR 41725 (July 6, 2000) is to be used, and the sources of the information documented.

g. Costs vs. Revenues. Carefully document the comparison of the costs with the projected returns and document the result. If the results are to be portrayed in a spread sheet, all entries must be labeled and explained. This is the ultimate bottom line of the report and it needs to be clear and concise. This will form the basis for writing the conclusions and recommendations sections of the report.

13. Selected References

a. Listing of References. List all pertinent references, cited or otherwise.

b. Format. Use either the USGS format (See U.S.G.S. Suggestions to Authors, pages 234-241), or as shown in the Handbook For Mineral Examiners (H-3890-1).

14. Illustrations. Place illustrations in the body of the report or include them with the attachments. The purpose of illustrations is to more effectively portray the data in the report. The proper use of them will enhance the report. Illustrations included in the report must be referenced in the text of the report.

a. Maps and Plats. All maps must have a title, scale (both graphic and written), north arrow, and legend/explanation of symbols used. (See U.S.G.S. Suggestions to Authors, 7th Edition, page 210 and Illustrations 6, 7, and 10-13.) When items are referred to in the text as being located on a map, they should be listed on the legend of the map using the same

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terminology as was used in the text, for example: “the waste rock bank” of the report should not become the “mine dump” of the map. Include the following maps and plats when appropriate.

- (1). A location map drawn at a suitable scale.
- (2). A legible topographic map, not a 5th or 6th generation xerox copy.
- (3). Suitable geologic maps, including regional maps, site-specific maps, underground geologic maps, and cross-sections.
- (4). Mine maps at suitable scales with mineralization, workings, and sample sites. These maps may occasionally be combined with the geologic maps.
- (5). A map of the claims or sites. This map must have the workings on it as well as the sample locations. It may be combined with the geologic or mine maps.
- (6). A mineral survey plat, if one exists.
- (7). A master title plat.

b. Photographs.

(1). Photographs are an excellent source of documentation of the mineral examiner=s activities and observations on the claim. Included photographs should be representative of activities and features such as claim monuments, site geology, sample sites, sample collecting procedures, surface improvements, mining and milling operations, ancillary facilities, and other pertinent features. It is not necessary nor desirable to include in the report a copy of every photograph taken during the course of the examination, i.e. every claim corner for a group of 365 claims. Sufficient photographs need to be included to adequately document the work and the situation on the claims. The remainder should be retained with the examiner=s field notes in their working file in case they may be needed in the future.

(2). All photographs must be properly captioned including at least the subject, date, and photographer.

c. Flow Charts and Process Sheets. These must be clearly labeled, pertinent, and explicit. They need to be big enough to be legible without the use of a hand lens.

15. Attachments

a. All attachments. These must be correctly and clearly labeled and referenced in the text of the report. They need to be big enough to be legible without the use of a hand lens.

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b. Source. Give the source of all attachments and properly cite them in the Selected References.

c. Common examples of attachments. These include, but are not limited to the following:

- (1). assay sheets, analytical reports, and consultant reports;
- (2). spread sheets developed for items such as mine modeling, cost estimating and economic evaluation;
- (3). location notices and affidavits of assessment work, if necessary;
- (4). correspondence, if essential to the report; and
- (5). smelter schedules and other pertinent documents

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Chapter III - Finalizing the Report

A. Report Review. The mineral report must be technically reviewed by a certified review mineral examiner appointed by the State Director (Deputy State Director, Mineral Resources) before being considered a final report approved by BLM. After this review is successfully completed the technical reviewer will sign the "technical approval" block on the mineral report cover sheet. Following technical approval, the Field Office manager or Deputy State Director acknowledges reading and understanding the conclusions and recommendations of the report by signing the "management acknowledgment" block on the mineral report cover sheet (see BLM Manual 3060.3).

1. Reviewer Consultation. After completing the draft mineral report, the examiner should send a copy of it to and schedule a meeting/conference with the technical reviewer. The reviewer and the author can discuss the contents of the report, any problems that need to be resolved, and needed corrections can be identified. Most of the reviewer's concerns can be worked out at this stage.

2. Revisions. Revise the mineral report in response to the technical reviewer's comments. Make all the revisions requested by the technical reviewer during the consultation process. Cooperation between the reviewer and examiner will facilitate the technical review.

B. Appeal of Technical Review. If the author cannot agree with the technical reviewer and the reviewer refuses to sign the report, the author may submit a written appeal to the Deputy State Director (DSD), Mineral Resources. The appeal must provide the technical issues of the disagreement.

1. Review of Appeal. The DSD will forward the appeal, the report, and both the reviewer's and examiner's comments to the BLM Mineral Examiners Certification Panel for review. The panel will prepare a written decision to be sent to the DSD. If the panel, by a majority "yes" vote, agrees with the author, the panel chairperson will sign the report for the panel and return the report to the DSD. If the panel does not sign off on the report, it will provide the mineral examiner with a list of changes that need to be made prior to the report being approved.

2. Final Panel Review. When the changes required by the Panel review are made, the report will be returned to the Panel for final review. If the panel required changes to the report and the examiner is unwilling to make those changes, the matter shall be referred to the DSD to assign a new mineral examiner. If the panel believes an untested legal issue is involved, it may recommend a request for a Solicitor's opinion.

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Chapter IV - Technical Review

A. Authority and Direction. BLM Manual 3895, Certification of Mineral Examiners, requires that a certified review mineral examiner sign the technical review block of the validity examination report cover sheet (BLM Form 3060-1). Before being presented to management for acknowledgment, all validity related mineral reports must be reviewed and approved by a certified review mineral examiner (see BLM Manuals 3060.41.A and 3895). Only a BLM certified review mineral examiner is authorized to perform final technical review of validity mineral reports for the BLM and other government agencies, including the U.S. Forest Service and National Park Service.

B. Goals. A technical reviewer's goals are to assure that:

1. The report. It must clearly state and meet its purpose.
2. Adequacy. The report must adequately state any assumptions and limiting conditions.
3. Data presentation. All legal, technical, and economic data must be accurate, adequate, and support the conclusions and recommendations of the report.
4. Documents. All necessary supporting documents are included.
5. Supporting material. All illustrations, attachments, and tables must be appropriate and complete.
6. Extraneous material. Not to be included. If it is, have it removed.
7. Confidential data. Must be safeguarded and treated correctly in the report.
8. Reviewer Checklist. Overall, the report must address the items in subpart F., Reviewer Checklist, given below.

C. Technical Reviewer/Author Relationship. Technical reviewers should make helpful, constructive, and appropriate comments with a positive attitude. The primary purpose of the technical reviewer is to ensure that the document is clear, concise, and technically correct. The review process is an iterative process so the reviewer and the author will benefit by informal consultations before, during, and after the review. Part of the reviewer's job is to serve as a mentor and enhance the skills of the mineral examiner. This can be done through positive constructive recommendations.

D. Technical Review and Editing. The terms "review" and "edit" are often applied loosely and interchangeably but have distinct connotations. In commonly accepted practice, reviewing a manuscript means to critically evaluate its subject matter and basic organization, whereas the editing of a manuscript, a later step, consists of correcting grammar, style, and formatting details. The reviewer's first responsibility is to evaluate the technical aspects of the report. A reviewer is

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required to thoroughly edit for grammar and is expected to make as many grammatical corrections as are needed. The reviewer can also edit for style if it is necessary for clarity.

E. Review Techniques

1. General. Whenever possible, the reviewer should work early on with the author in the field and in the office to work out procedures and concepts to be used in the field examination and the report. A technical reviewer should see that reports are objective, complete, accurate, clear and concise. A reviewer must ensure that the report is based on accepted professional standards and complies with all current Departmental legal and technical standards, guidance, and procedures.

2. Process. The reviewer should first read the entire report to gain a proper perspective. The reviewer should then reexamine the report concentrating on areas of concern. Written comments are to be specific to the issue, clearly explained, and prepared in a positive and appropriate manner. Avoid such comments as "really (?)," "awkward," "not clear," "explain," "expand," and "evidence" which do not fully explain the necessary corrective measures.

3. Comments and Suggestions. These should be written on a copy of the report. An overall summary and explanation of any major deficiencies should be prepared in narrative form on separate pages, with the page number and paragraph needing attention clearly identified. When deemed necessary, the reviewer and the author should meet to discuss the issues and their resolution. If they cannot meet, they will have to communicate through correspondence and by telephone.

F. Reviewer Checklist.1. Complete

- a. Information. Does the report give all needed information?
- b. Factual Matters. Does the report answer all the questions concerning the factual matters that determine the validity of the mining claim or site?
- c. Omissions. Does the report contain any holes or missing material?

2. Concise

- a. Essential Facts. Does the report contain only essential facts?
- b. Essential Words. Does the report include only essential words and phrases?

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c. Maps and Attachments. Does the report contain only the necessary maps and attachments?

d. Case Law. Are discussions of case law and citations limited to only those necessary to buttress the report?

3. Clearness

a. Language. Is the language adapted to the audience; are the words the simplest that carry the thought?

b. Expression. Do the words exactly express the thought?

c. Sentence Structure. Is the sentence structure clear?

d. Paragraph Contents. Does each paragraph contain only one main idea?

e. Information Presentation. Is there an orderly flow of information in the report?

4. Correctness

a. Accuracy. Is the information presented accurate?

b. Current Policies. Do the statements conform with current laws and regulations?

c. Grammar. Is the text free from grammatical errors?

5. Critical eye

a. Objectivity. Is the report objective and unbiased?

b. Tone. Is the text free from invective, insulting, or inflammatory language?

c. Jargon. Is the text free from unnecessary jargon and legalistic phrases?

d. Claimant Data. Did the examiner look objectively at all the data the claimant provided?

e. Independent Verification. Does the examiner seem to be relying too heavily on the claimant's data and failing to do enough independent verification of facts and figures?

G. Section Specific Comments. A reviewer must check the mineral report against the standards in Chapter II of this handbook. The following are key points to remember:

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1. Title page. Is the title page complete? Are the serial number(s) and title correct? Is the legal description correct? Is the title page signed, dated, and stamped?
2. Table of Contents. Do the headings and the page numbers of the text match those in the table of contents? Are all the attachments, maps and illustrations listed?
3. Summary, Conclusions, and Recommendations. The target audience for this section is primarily management and attorneys. Is the summary clear and generally free of technical jargon? Does it fully capture the critical aspects of the report? Is the summary short and to the point? Does it include a synopsis of the work and the findings? Check to make sure that the summary matches the rest of the report. Are the conclusions clear and supported by the report? Are the conclusions legally correct? Do the recommendations logically follow from the conclusions and not introduce new information or raise new issues? If contest is recommended, are the standard contest charges contained in BLM Handbook H-3870-1 used?
4. Introduction. Is the purpose of the report clearly stated? Is the case history clear? Are all key participants listed? Were there any impediments to the examination that should be addressed? Is the standard report disclaimer statement included?
5. Land Status and Record Data. Are the lands involved clearly described? Are the legal description(s) correct? If a mineral survey covered the lands involved, is it referenced and included as an attachment? Are any legal restrictions, such as withdrawals or Wilderness Study Areas addressed? Is the appropriate mining claim recordation information included?
6. Physical Features and Access. Is the access route's location to the subject lands clearly described? Are any physical or legal impediments to access adequately addressed? Has the mineral examiner adequately established their location on the claims? Does the report describe the climate and vegetation of the area involved? Are T & E species addressed? Are cultural issues identified and addressed? Are the topographic features adequately addressed?
7. Regional Geology and Mining History.
 - a. Geologic Setting. Is the geologic setting focused, i.e. limited to the mountain range, mining district, or other localized area? Is the discussion too broad or unrelated to the purposes of the report? Does this section properly set the stage for the discussion of the site geology?
 - b. Maps and Illustrations. Do the geologic maps, illustrations, and photographs portray the important geologic features? Are they properly and adequately labeled? Are the maps at a proper scale to show important relationships? Are the illustrations relevant? Are they pertinent and if so, are they referenced in the text?

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c. Past History. Has relevant information about past mining, milling, and production been provided for the property?

8. Geology and Mineralization of the Claims.

a. Site Geology. Did the mineral examiner describe the geology on the claims involved? Is the discussion of the site geology specific to the mineral property and the immediate area? Did the mineral examiner describe his or her observations about the geology? Is the information presented clearly and concisely? Does this discussion focus on the features that are controlling the mineralization? Does this section set the stage for the mineral deposit discussion?

b. Map Scales and Labels. Are the geologic maps, cross-sections, illustrations, and photographs adequately and properly labeled, and do they show the important geologic features of the property? Are the maps at a proper scale to show important relationships? Are the illustrations relevant, pertinent, and referenced in the text?

c. Structure, Alteration, and Mineralogy. Is there enough detailed information about the mineral deposit, i.e. host rock type, mineralogy, structural control, alteration to make reasonable tonnage/grade estimates? Do the maps, cross-sections, illustrations, and photographs, support, clarify, and build on the narrative? Are the maps, cross-sections, and other illustrations pertinent and properly labeled at the correct scale?

9. Mineral Exploration and Development Work. Do the maps and narrative adequately describe the access and exploration work? Are all of the accessible mine workings adequately described and mapped at a suitable level of detail? Has existing drilling been adequately described and analyzed? For patent applications, are the statutory improvements necessary for patent met, is the work of a qualifying nature, and the amount of qualifying expenditures equal to at least \$500 per claim?

10. Mining, Milling, and Related Operations. Are all operations associated with the mining, milling, and reclamation described in detail appropriate for the property? Is a detailed cost estimate necessary and if so did it consider all of the following items:

a. Production and Milling. Have mine production rates, mill feed rates, and concentration ratios for each proposal been included? Is there a flow chart of the milling process? If necessary, is the metallurgical balance prepared?

b. Equipment. Is ownership and condition of equipment addressed? Is the equipment suitable and properly sized for the proposed operation?

c. Facilities and Transportation. Does the report address the location of facilities and hauling of materials and supplies as well as the transportation of ore, concentrates, and waste?

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d. Reclamation and Mitigation. Is the necessary environmental mitigation and reclamation properly addressed?

11. Field work, Sampling Procedures and Analytical Work.

a. Field Examination. Have all aspects of the field examination been documented? Check for overlap and inconsistencies with previous sections.

b. Sampling Procedures. Are the sampling procedures described in adequate detail? Is any deviation from the sampling procedures outlined in BLM Handbook H-3890-1 described and justified? Are the sample points adequately described and clearly marked on the correct maps? Are the chain of custody and sample security procedures clearly described and are they appropriate? Is the rationale for sample site selection and sample distribution explained in the text? Is there an appropriate correlation between the size and weight of the samples?

c. Laboratory and Analytical Work. Have the samples been tested for the proper minerals? Are proper analytical methods used? Did the laboratory have the correct ISO certification? If not, is the laboratory appropriate for the analytical work performed and is it properly justified in the report? Are any unusual or nonstandard procedures or test protocols explained? Are the results of the analytical and testing work described in a clear and easily understandable manner? If analytical results are given in more than one place, are they consistently reported?

12. Economic Evaluation

a. Grade and Tonnage Verification. Is the method selected to portray grade and tonnage estimates reasonable for the type of deposit, deposit model, and sampling techniques employed? Is the work fully explained? Do the estimates of tonnage and grade seem reasonable? Are the calculations correct? Are the proper density factors used? Is information presented in tables, charts, or spreadsheets clearly labeled, useful and does it include appropriate units? Do the units of measure utilized throughout the report comport with accepted industry practice for the type of deposit and commodity under investigation?

(1). Criteria. Does the mineral report fully explain the criteria used for determining the characteristics on which grade is based? Does it reference ASTM standards, market requirements, contract requirements and other factors if necessary? Are the methods used to assign volumes and grades for each geologic or mining unit fully explained, referenced to maps and sections, and appropriate? Is the swell factor properly determined and utilized?

b. Mining and Cost Estimation Methods. Is the mining method selected the most cost effective? Is it thoroughly described and evaluated? Is it realistic for the deposit in question? Is the equipment properly sized? Are capital and operating costs properly estimated and clearly documented? Are all the necessary costs included under the appropriate categories?

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Are the cost estimating methods used and the sources of the cost information sufficiently documented?

c. Transportation, Beneficiation, Marketing. Are all beneficiation, transportation, and marketing costs appropriately considered and documented? Are all cost estimating assumptions reasonable and clearly stated? Check to see that costs are not double counted. For example when using a suitable cost model that has a cost of overburden removal built in, it is not appropriate to later add a separate line item cost for overburden removal.

d. Market Studies. Is the issue of marketing properly addressed? Is a market study necessary and was it properly done? Does the report address the point of sale in vertically integrated markets and select the appropriate one for the commodity involved?

e. Permitting and Mitigation. Are the necessary environmental and cultural permitting, mitigation, reclamation and rehabilitation costs clearly identified and addressed?

f. Pricing Policy. Is the Bureau's commodity pricing policy properly used and the sources of the information documented?

g. Calculation Verification. Did the mineral examiner add and subtract correctly to get the bottom line? Is the comparison of the costs with the projected returns carefully documented?

13. Selected References. Are all the references used in the report and the attachments properly cited?

14. Illustrations. Do all the maps have titles, scales, legends, and north arrows? Are all photographs properly captioned? Are all the illustrations referenced in the text, and are they relevant? Are the flow charts and process sheets clearly labeled, pertinent, and explicit?

15. Attachments. Are all the attachments correctly and clearly labeled? Are they relevant and referenced in the text of the report?

H. Confidential Information. Verify that any confidential information in the report has been clearly identified and handled in a manner that allows it to be easily located and detached or deleted.

I. Reports That Meet All Technical or Legal Standards. If all is in order, the reviewer will sign on the form 3060-1 in the space provided for the technical reviewer's signature. The date and reviewer's job title are also entered here.

J. Reports That Fail Technical or Legal Standards. Authors are to make changes requested by reviewers. If the author(s) refuse to make the changes and major points of difference develop, the reviewer and the author(s) must document these. If there is a disagreement with the author(s)

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that cannot be resolved, the report will be sent to the Deputy State Director (DSD), Mineral Resources along with appropriate comments from all parties.

1. Forward the Report to the Panel. The DSD will forward the report and the comments to the BLM Mineral Examiners Certification Panel for review.

2. Panel Review. After panel review, a written decision will be sent to the DSD. If the panel, by a majority "yes" vote, agrees with the author(s), the panel chairperson will sign the report for the panel and return the report to the DSD. If the panel does not sign off on the report, it will provide the author(s) with a list of changes that need to be made prior to the report being approved. Once those changes are made, the report will be returned to the panel for final review.

3. Required Changes by The Panel. If the panel requires changes to the report and the author(s) are unwilling to make those changes, the matter shall be referred to the DSD to assign a new mineral examiner. If the panel believes an untested legal issue is involved, it may recommend the DSD request a Solicitor's opinion.

K. After Technical Approval

1. Management Acknowledgment. According to BLM Manual 3060.4, once reviewed and approved by a certified review mineral examiner, the conclusions in a mineral report are not subject to revision by management. The conclusions are the professional opinion of the mineral examiner. The mineral report's recommendations are advisory. The manager's signature on the mineral report cover sheet means that the report has been read and that the conclusions and recommendations presented are acknowledged (see BLM Manual 3060.08.E).

2. Public Review and Disclosure. The controlling regulations are 43 CFR § 3862.9 and 43 CFR § 2.13(c)(4) & (9) and § 2.13(d). Prior to case disposition, the mineral report is an internal working document, pre-decisional in nature, and as a whole is not releasable. The exception to this is that DOI's Office of General Law (FOIA Appeals Office) has held that after technical review, we can release limited portions of the mineral report: table of contents, introduction, land status, regional geology, and BLM obtained raw sample data (the sample locations and assay sheets). We may not release the site geology (geology and mineralization of the claims), the cost analysis, economic analysis, market analysis, reserve and grade data, or any deliberative analysis or statements including the summary, conclusions, and recommendations. We may not release any claimant submitted data without the claimant's written consent (18 U.S.C. § 1905). After case disposition, with the exception of proprietary or confidential information, the report is releasable under standard FOIA procedures.

3. Case disposition means:

a. Patents. In case of a patent application, the patent is issued.

b. Contests. In the case of a contest, the contest complaint is issued.

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c. Valid Existing Rights. In the case of a valid existing right determination (where no contest will issue), when the management acknowledgment is signed or refused.

d. Patent and Contest Combined. In the case of patent in part and contest in part, when the patent has been signed and the complaint issued.

L. Suggested References for the Reviewer.

The following references are helpful in giving suggestions for review of mineral reports:

Freidman, Morris, 1963, The seven sins of technical writing, IN Technical and professional writing-a practical anthology; Estrin, Herman A., ed, 1963; Harcourt, Brace, & World, Inc., New York, N.Y., p. 139-148.

Hansen, Wallace R., ed, 1991; Suggestions to authors of the reports of the United States Geological Survey, 7th ed.; U.S. Geological Survey, U.S. Government Printing Office, Washington, D.C.

Hartman, Howard L., ed, 1992; SME Mining Engineering Handbook, 2 Vols., Society for Mining, Metallurgy, and Exploration, Inc., Littleton, Colorado.

Weiss, Norman L., senior ed., 1985; SME Mineral Processing Handbook, 2 Vols., Society of Mining Engineers, American Institute of Mining, Metallurgical, and Petroleum Engineers, Inc., New York, New York.

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I. Cover Sheet.

- A. Use Form 3060-1.
- B. Serial number
- C. Case Title.
- D. Lands involved
 - 1. Legal description
 - 2. County, State
 - 3. Approximate acreage involved.
 - 4. Preparer's name. LEGIBLY print your name where it says "Prepared by," sign your name on line provided, your job title which must include your normal duty station, even if you are someplace on detail; and date.
 - 5. Technical Review
 - 6. Management Acknowledgment

II. Table of Contents.

- A. Each section used in the report, and beginning page numbers.
- B. List of all Attachments
 - 1. List attachment names and numbers, and print names and numbers on each attachment.
- C. Each and every page must have some sort of numeric or alphanumeric identifier that will allow the reader, who may be a judge, to find it more than once. That includes pages that contain attachments, appendices, and photographs.

III. Summary, Conclusion, Recommendations.

- A. Must fully brief reader on your findings without a detailed reading of your report. Write these sections last. Remember that your audience consists of managers and attorneys. It is your job to demystify science, engineering, and economics.

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1. Using separate headings for each (summary, conclusions, recommendations) will usually help you organize your thoughts and avoid redundancy. Separate headings are preferred. They help you and the reader keep the concepts separate. It also makes it easier for your office coordinator to respond to a Freedom of Information Act request.

a. The 1994 edition of BLM Manual Section 3060 can be interpreted to require that the report contain two sets of conclusions, buried somewhere in the body of the report. Don't do that. Use one set, only, at the front.

2. Clearly summarize what you did in the examination, your analysis, and the report.

3. Briefly state your conclusions based on the results of the report (discovery present or absent, mineral in character, etc.).

4. Your recommendations (i.e., issue patent; initiate contest with specified charges).

B. Place Summary, Conclusion, and Recommendations on separate pages so they can be easily removed from the body of the report (See BLM Manual section 3060.18 A 4 for the reason).

IV. Introduction.

A. Purpose of the report: Reason for management action.

1. Patent exam
2. Validity exam
3. Realty Action
4. Determination of Valid Existing Rights
5. Alleged Mineral Trespass

B. Brief history of the case.

1. Date case assigned, and by whom.
2. Date of notification of claimants and interested parties for the examination.
3. Impediments (if any) to your examination.

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- a. Weather.
 - b. Access.
 - c. Threats.
4. Dates of examination.
5. People present during examination, and when.
- a. Field personnel.
 - b. Claimants.
 - c. Claimants' representatives.

F. State that conclusions of report are limited to the management action prompting the report. State that the report will not serve as an appraisal of value.

V. Lands Involved.

A. Description of lands.

- 1. Legal Subdivision.
- 2. Metes and bounds.
- 3. Protracted survey.
- 4. Mineral survey number
- 5. Acreage.

VI. Land Status and Record Data.

(Use tabular format for portions of this section if it will add clarity and save space).

A. Status of land involved.

- 1. Public land.
- 2. National Forest.

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3. National Park, Monument, Preserve, or other Unit.

4. Split Estate

5. Encumbrances.

a. Withdrawals.

b. Land classifications.

c. Valid existing rights.

d. Mineral leases (serial numbers).

e. Mining claims (serial numbers).

f. Material sites (serial numbers).

g. Rights-of-way

6. Pertinent data from BLM Historical Index.

B. Mining claims involved.

1. Names (verbatim from records--do not correct "misspellings" on the claimants' location notice) and BLM serial numbers.

2. Location notice data

3. Assessment work affidavit data.

4. Chain of title data from BLM and/or county records.

5. Names of claimants.

VII. Physical Features and Access.

A. Geographic location.

B. Physical features, topography.

C. Access.

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1. Describe generally, and refer to a useful map in your attachments.
- D. Availability of water, power, etc.
- E. Method of identification of claims on ground.
1. U.S.G.S. topographic map.
 2. Aerial photographs.
 3. Mineral survey plat and survey markers.
 4. Location and corner monuments.

VIII. Regional Geology and Mining History.

- A. Concise description of regional geology. (Your purpose is NOT to present the definitive, comprehensive geologic work on the physiographic province.)
1. Cite published information.
 2. Refer to the geologic map in your attachment section.
- B. Mining history of the region.
1. General exploration and mining interest.
 - a. Subject mineral commodities.
 - b. Other mineral commodities.
 2. Adjacent or previous mining history at site.

IX. Geology and Mineralization of Claims.

- A. Describe local geology.
1. Structure.
 2. Alteration.

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3. Lithology.

B. Describe mineralization and associate with geology.

1. How does mineralization occur? (i.e., disseminated, ore shoots, veins, placer, volcanic ash altered to zeolites, etc.)

2. Describe size, shape, and attitude of mineralized structure.

3. Identify valuable minerals, associated minerals, and gangue minerals.

4. Identify potential sulfide problems, and other potential deleterious material or conditions.

X. Mineral Exploration and Development Work.

A. Describe work done. Indicate size, depth, length, and purpose if known, and refer to map in attachment section.

1. Access.

a. Roads.

b. Tramways.

c. Rail transport.

d. Waterways.

2. Mine workings and their condition.

a. Shafts, adits, drifts.

b. Pits, cuts, trenches

XI. Mining, Milling, and Related Operations.

A. Describe equipment and process (if any) claimant uses or plans to use to process ore.

1. Include descriptions of Mills and/or Plants.

B. Attach a flow chart if available. If not available, create one.

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XII. Field Work, Sampling Procedures and Analytical Work.

A. Describe each sample point in relation to:

1. Type and number of samples collected.
2. Sample dimension and weight.
3. Relationship to structure or country rock.
4. Reason for sampling at each location.
 - a. Requested by claimant.
 - b. Discovery point.
 - c. Evaluation based on your reconnaissance.

B. Explain sample representation.

1. Area of influence of sample.
2. What does sample represent?

C. Chain of custody and security of samples.

1. There are legal reasons for this.
2. If you collected core splits, explain how you know that core splits were not tampered with.

D. Company Data

1. If used, show how you determined that results are reliable.
 - a. Examined random core. State core size.
 - b. Core splits. Describe condition & recovery.
2. Did you witness sampling? If not, explain.
3. Twinned drilling?

E. Assay results

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1. Analytical method(s) chosen and reason.
2. Laboratory used.
3. Describe any unusual problems.
4. Describe correlation between assays or company core splits and your core splits.
5. Tabulate results for easy reading and result comparison.

XIII. Economic Evaluation.

- A. Calculate best estimate of tonnage and grade of mineralization.
 1. Calculating an average grade may be the wrong approach.
 2. Look also at smaller, high-grade bodies and their economic potential.
- B. Describe appropriate mining method.
 1. If different from claimants' proposed method, explain.
 2. Determine minimum mining width and/or rate if appropriate.
- C. Determine and itemize costs of mining, beneficiation, smelting, leaching, as appropriate. Do not "double index" costs.
- D. Describe markets and marketing. This is necessary even for precious metals, especially placer gold.
 1. This section may be extensive for industrial minerals, usually nonmetallic.
 2. Consider effects of secondary, scrap, and recycling markets.
 3. Is market open or vertically integrated?

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4. Is there a futures market?

5. Is there a discount from spot price to account for testing or refining?

6. Is there a premium paid for specimen grades and if present, are they in sufficient quantities to be significant.

E. Calculate reclamation and rehabilitation costs. Consider all that are appropriate. You may need to research state laws. Document research in your case file. Do not double calculate concurrent reclamation costs already built into the mining plan. If not included in the mining plan, calculate reclamation costs in a separately headed section.

F. Analyze and compare above costs in relation to value of mineralization. Consider:

1. Percent recovery.

2. Dilution.

3. Potential for fluctuating commodity value.

G. Determine probable economic viability of the property based on your analysis.

XIV. References.

A. List all references cited.

B. Use U.S.G.S. format, or as shown in Handbook For Mineral Examiners.

XV. Attachments or Appendices.

Do not call this section "Exhibits." Use the word "Attachments" or "Appendices." In an administrative hearing, your mineral report will probably be introduced as "Government Exhibit 2." This will become confusing as you refer to your geologic map as "Exhibit 2 of Government Exhibit 2."

A. Maps and plats.

1. Location index map.

2. Topographic map.

3. Geologic Maps (as appropriate)

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- a. Regional.
- b. Site specific.
4. Master Title Plat.
5. Mineral Survey Plat.
6. Mine maps.
 - a. Surface.
 - b. Underground.
- B. Documents, as needed.
 1. Location notices
 2. Assessment work affidavits, if significant.
 3. Correspondence as appropriate.
 4. Smelter schedules.
 5. Other pertinent documents.
 6. DO NOT attach a document unless you refer to it in the text.
- C. Flow Charts and Process Sheets.
- D. Photographs.
 1. Site information.
 2. Sampling sites, before and after. (Use a low-reflectance photo sign in the picture.)
 3. Surface improvements and facilities.
 4. Photographs must be affixed to pages.
 5. All photographs must be clearly captioned, i.e., "**View of Sunset Lode Mining Claim looking west showing portal to main adit. Photographed by A. P. Fomswick, 12/26/52.**" Generally, two photographs will fit on a standard page. A simple way to do this is locate the captions on each page using a word processor or typewriter. Affix the photographs in

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the appropriate locations with tape or cement. Modern photocopiers will reproduce photographs with good resolution for noncritical copies of your report. Duplicate photographs can be affixed over the photocopies, if needed.

6. Photographs used as stand-alone evidence in criminal or civil trials are usually introduced independent of reports. Some attorneys prefer to introduce unmounted photographs. An exact copy of the page's printed caption should be typed on a pressure-sensitive ("sticky") label and affixed to the back of each photograph. Doing so assures that the caption will accompany the photograph if it is removed from the report page.

7. Digital photographs may be acceptable. However, a complete, detailed caption becomes even more critical if digital photographs are to be used.

Points to Note

This Appendix replaces the validity report format given in Manual Section 3060, Illustration 3.

Your report must be internally consistent. Your conclusions must be supported by the body of the report. It is best to write your conclusions section last. Your report should read almost like a novel. **The reader must be able to read the report, from front to back, without ever referring to an attachment**, and still understand what you did, your conclusions, and your rationale. Attachments are to be used to document or to further explain portions of your work. Any document or item which is appended to the report as an attachment must be referred to in the text. If you do not refer to an attachment in the text, you don't need the attachment.

If your examination resulted in a lengthy or complicated economic analysis, it is generally acceptable to append that analysis as an attachment. However, the economic evaluation needs to be summarized in the text. That text summary needs to include the assumptions, rationale, your approach to the analysis and the results. Do not leave the reader hanging. The main text must contain the "bottom line".

If you choose to include your economic analysis as an attachment, it is essential that the appended economic analysis be as readable as the main report.

Your target audience is not geologists and mining engineers. Your audience will consist of managers and attorneys. However, geologists and engineers will read and rely upon your report. It is your job to demystify science, engineering, and economics. You must strike a balance.

Do not make legal conclusions unless you are a judge. Let your attorney cite case law in court and in briefs. Avoid quoting case law unless it is an absolute necessity, and even then, think twice about it. Consider writing a separate memo for your attorney that contains the case law citations that you relied upon. Remember that your report is a piece of a case. It is a large, important piece, but it is not the whole case.

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It is common to use a spreadsheet in the preparation of an economic analysis. Be sure that you fully understand what the spreadsheet does. You will almost never have your computer available on the witness stand. If you do, anything contained on the hard drive may be subject to examination by the opposition's attorney. You must be fully prepared to make changes to your calculations while on the witness stand, using only a pencil and a calculator. Bring your own calculator to court.

If you use spreadsheets in your calculations, do not append page after page of numbers in columns. Anything that you append to your report must be understandable. If you must append copies of a spread sheet, each line and entry must be captioned as to what it means and what it does. Portray the information in such a way that it can become a crib "note" to yourself, in the event that you are directed to make recalculations on the witness stand. (Some judges will call this "recasting" your calculations.) Be ready for it. It's normal, and you can't prevent it. If you can't do it, your credibility will be diminished.

Your report must make sense without having to consult any additional source. Your target audience normally won't have the opportunity to visit the claim.