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PRIMER ON THE THEORY AND PROOF OF DISCOVERY OF VALUABLE MINERAL DEPOSITS UNDER THE 1872 MINING LAW

Thomas W. Frizzell and Jean Meuli Kunz*

It has become increasingly difficult for mineral locators to prove that they have made a discovery of valuable minerals. The decisions of the administrative courts invariably involve someone who has worked his claim sporadically, if at all, and has little idea that discovery does not simply mean finding some minerals.¹ Few miners have the resources to survive extended administrative challenges.² The proof they offer, because of the limited evidence produced and a failure to understand the discovery requirements, often is insufficient to provide a basis for a favorable judgment.³

This article provides a framework for analyzing the law of discovery and a basis for developing evidence which is sufficient to prove a discovery. This is not an article for the experienced mineral lawyer. Instead, it is designed to serve the general practitioner who has a mining claim to protect, the geologist or other mining professional seeking to learn more of the mineral law, or the claimant who must defend his property's title.⁴

I. OVERVIEW

The 1872 Mining Law provides that all valuable mineral deposits in lands belonging to the United States shall be free and open for exploration and purchase.⁵ Over the last one hundred years, the courts and the Department of the Interior have developed a large body of law construing the meaning of these few words.

The courts have added substance to the 1872 Mining Law by adopting

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1. See *United States v. Bartels*, 6 I.B.L.A. 124 (1972).

2. H. Tognoni, *Rule of Man vs. The American Mining Laws: The Persecution and Elimination of the Small Miner on Public Lands in the United States*, 55 N.D.L. REV. 339 (1979).

3. See *United States v. Chambers*, 47 I.B.L.A. 102 (1980); *United States v. Penrose*, 10 I.B.L.A. 332 (1973); *United States v. Bartels*, 6 I.B.L.A. 124 (1972).

4. A more detailed study of the law of discovery is set forth in the following treatises, books and articles, and in others too numerous to list: ROCKY MTN. MIN. L. FOUND., 2 AMERICAN LAW OF MINING, § 35, p. 35-1 (2d ed. 1984); T. MALLEY, HANDBOOK OF MINERAL LAW (3d ed. 1983); J. Neff, *The Miners Law*, 19 IDAHO L. REV. 577 (1983); Shanahan, *Hardrock Mining on the Public Lands*, 2 PUB. LAND L. REV. 57 (1981); G. Reeves, *The Law of Discovery Since Coleman*, 21 ROCKY MTN. MIN. L. INST. 415 (1975); G. Reeves, *The Origin and Development of the Rules of Discovery*, 8 LAND & WATER L. REV. (1973).

5. 30 U.S.C. § 22 (1982).

many of the practices followed in the mining camps and the doctrine of "free mining" developed in the ninth and tenth centuries.⁶ Under these laws, miners received possessory rights to ground actively being worked.⁷ When the miner wished to acquire title to the minerals, he not only had to work the claim, but also had to prove that he discovered valuable minerals.

The laws of mining still require a miner to prove discovery before he can acquire mineral title to an unpatented location.⁸ Two steps are necessary to prove a discovery of valuable minerals. First the mineral claimant must demonstrate that a mineralized deposit was found within the bounds of the claim. Then, evidence proving that the deposit is valuable must be presented.⁹

These two steps must be met regardless of the test of discovery applied by the courts or the type of contestant.¹⁰ Both tests of discovery, the prudent man and marketability rules, require proof that a mineral deposit was exposed and that the mineral deposit exposed is valuable. The contestant to a mining claim may be another miner, the federal government, or a user of the surface resources. When the contestant changes, the type of proof necessary to meet the standard embodied by these rules also changes. When two miners claim the same deposit, less proof is required, as the deposit's value has been explicitly admitted by the parties.¹¹ However, when a mineral locator is competing with another, such as the United States government, full proof of both the mineralization found and its value must be shown to comply with the statutes granting mineral title to an

6. See J. Neff, *supra* note 4.

7. The doctrine of *pedis possessio* is set forth in *Union Oil Company of California v. Smith*, 249 U.S. 337, 346 (1919):

[F]or since, as a practical matter, exploration must precede the discovery of minerals, and some occupation of the land ordinarily is necessary for adequate and systematic exploration, legal recognition of the *pedis possessio* of a *bona fide* and qualified prospector is universally regarded as a necessity. It is held that upon the public domain a miner may hold the place in which he may be working against all others having no better right, and while he remains in possession, diligently working towards discovery, is entitled—at least for a reasonable time—to be protected against forcible, fraudulent and clandestine intrusions upon his possession.

This proposition is also set forth in *Cole v. Ralph*, 252 U.S. 286, 294 (1920): "In advance of discovery an explorer in actual occupation and diligently searching for mineral is treated as licensee or tenant at will. . . ." See also *ROCKY MTN. MIN. L. FOUND.*, 2 *AMERICAN LAW OF MINING*, § 34, p. 34-4 (2d ed. 1984).

8. *United States v. Coleman*, 390 U.S. 599, 602 (1968); *Castle v. Womble*, 19 Pub. Lands Dec. 455, 456-457 (1894), *cited with approval* in *Chrisman v. Miller*, 197 U.S. 313, 322 (1905), setting forth the prudent man rule of discovery.

9. *Id.*

10. *ROCKY MTN. MIN. L. FOUND.*, 2 *AMERICAN LAW OF MINING*, § 35, p. 35-61 (2d ed. 1984). *Accord G. Reeves, The Origin and Development of the Rules of Discovery, supra* note 4, at 35.

11. *Chrisman v. Miller*, 197 U.S. at 323; *Silver Jets Mines, Inc. v. Schwark*, ___ Mont. ___, ___, 682 P.2d 708, 712 (1984); *Anaconda Company v. Whittaker*, ___ Mont. ___, ___, 610 P.2d 1177, 1179 (1980). *Accord ROCKY MTN. MIN. L. FOUND.*, 2 *AMERICAN LAW OF MINING*, § 35, p. 35-34 (2d ed. 1984).

unpatented mining claim.¹² Because of the different nature of inquiry the type of proof necessary to satisfy the legal standard of discovery changes.

The sliding scale type of proof required to show a discovery of valuable mineral under the 1872 Mining Law¹³:

1. Provides a guarantee that land not valuable for minerals, or where a deposit has not yet been found, remains open for various uses, including mineral exploration;¹⁴
2. Allows miners time to develop the proof necessary to prove possessory title against all the world, including the sovereign;¹⁵ and
3. Disallows competing uses from diminishing the locator's possessory right to hold and mine the claim as long as the deposit remains valuable.¹⁶

The body of this article sets forth the type of proof required to prove a discovery against either another mineral claimant or the government. The first step in determining the proof required is an understanding of the judicial standard of discovery embodied by the marketability and prudent man rules.

II. THE STANDARD OF DISCOVERY: THE PRUDENT MAN AND MARKETABILITY RULES

Two complimentary rules have been developed to describe the discovery of valuable minerals. The long-standing prudent man rule is: . . . [W]here minerals have been found and the evidence is of such a character that a person of ordinary prudence would be justified in further expenditure of his labor and means, with a reasonable prospect of success, in developing a valuable mine, the requirements of the statute have been met.¹⁷

The rule consists of two parts: first, minerals must be found; second, the evidence of the mineralization must be of such a character that a

12. *United States v. Murdock*, 65 I.B.L.A. 239 (1982).

13. 30 U.S.C. § 22 (1982).

14. Where there is no discovery, the location is invalid and there is no right to exclude anyone. The land remains open for others to explore and prospect. See *Ickes v. Underwood*, 141 F.2d 546, 549 (D.C. Cir. 1944).

15. Since a locator may have sufficient evidence to prove discovery against another mineral claimant, but not against the United States or others, the locator's right of possession is protected while he explores the actual deposit. See *Henault Mining Co. v. Tysk*, 419 F.2d 766 (1969), *cert. denied*, 398 U.S. 950 (1970) (where the locator found a mineral shoot of the vein and this was insufficient to show a discovery).

16. Once full discovery of a valuable mineral is shown, the claimant acquires the right to minerals which is for all practical purposes as good as though secured by patent or deed. *Wilbur v. United States ex rel. Krushnic*, 280 U.S. 306, 317 (1930); *Union Oil Co. of Cal. v. Smith*, 249 U.S. 337, 349 (1919); *Bradford v. Morrison*, 212 U.S. 389, 394 (1909).

17. *Castle v. Womble*, 19 Pub. Lands Dec. at 456-7, *cited with approval in*, *Chrisman v. Miller*, 197 U.S. at 322.

prudent person would expend further resources with the reasonable prospect of developing a valuable mine.¹⁸ This rule has been used regardless of the type of contestant,¹⁹ being applied in cases involving rival claimants, conflicting users of the public domain, and the title holder.²⁰

The development of the prudent man rule has resulted in the addition of a "complimentary" test,²¹ the marketability rule, which requires:

[A] mineral locator or applicant, to justify his possession, must show that by reason of accessibility, *bona fides* in development, proximity to market, *existence of present demand*, and other factors, the deposit is of such a value that it can be mined, removed and disposed of at a profit.²²

The marketability rule is not a great extension of the prudent man rule, but its application by administrative courts has sometimes given it that appearance.²³ It quantifies the requirement of the prudent man rule that the mineral found must justify further expenditure of labor and means with a reasonable prospect of success in developing a valuable mine.²⁴ Certainly, a prudent man would not spend money developing a mine unless market conditions provided some hope of making a profit.

The marketability rule is not consistently applied. It is generally cited and followed when a mining claim is challenged by the federal government.²⁵ Where another user of the government's land, a licensee or lessee, challenges the unpatented locator's claim, the marketability rule is used.²⁶

18. *Id.*

19. ROCKY MTN. MIN. L. FOUND., 2 AMERICAN LAW OF MINING, § 35, P. 35-36 (2D ED. 1984).

20. Title holder is used rather than United States because the same standard applies whether the contesting party is a private individual holding a grant of title from the United States or the United States government. *Thomas v. Morton*, 408 F. Supp. 1361, 1368 (D. Ariz. 1976), *aff'd.*, 552 F.2d 871 (9th Cir. 1977) (stock raising homestead patentees); *Dugrud v. Best*, 291 F.2d 235 (9th Cir. 1965), *cert. denied*, 372 U.S. 906 (1963) (holder of a special use permit issued by the Forest Service); *Alyeska Pipeline Service Company v. Anderson*, 629 P.2d 512 (Alaska 1981) (builder of the Alaska pipeline challenged claimant.)

21. The marketability rule was adopted by the Supreme Court in *United States v. Coleman*, 390 U.S. at 602 (1968). The Court found this test to be complementary to, not different from, the prudent man rule. *Id.*

22. *Foster v. Seaton*, 271 F.2d 836, 838 (D.C. Cir. 1959), *citing with approval*, *Taking of Sand and Gravel from Public Lands for Federal Aid Highways*, 54 Interior Dec. 294, 296 (1933).

23. It is difficult to find administrative decisions where the mineral claimant wins. This often is a result of the minimal proof offered rather than the stringency of the rule. *E.g.*, *United States v. Chambers*, 47 I.B.L.A. 102 (1980); *United States v. Penrose*, 10 I.B.L.A. 332 (1973); *United States v. Bartels*, 6 I.B.L.A. 124 (1972).

24. *United States v. Coleman*, 390 U.S. at 602; *Converse v. Udall*, 399 F.2d 616, 622 (1968), *cert. denied*, 393 U.S. 1025 (1969); *Marvel Mining Co. v. Sinclair Oil and Gas Co.*, 75 Interior Dec. 407, 414 (1968).

25. *United States v. Marion*, 37 I.B.L.A. 68 (1978); *United States v. Osborne*, 28 I.B.L.A. 13 (1976); *United States v. Gold Placers, Inc.*, 25 I.B.L.A. 368 (1976).

26. *Alyeska Pipeline Service Co. v. Anderson*, 629 P.2d 512 (Alaska 1981) (mineral claimant's discovery was challenged by the builder of the Alaska Pipeline and the marketability test was applied).

However, many state courts have seemingly refused to apply this rule in cases between rival claimants.²⁷

This mixed application results, in part, from a belief that the marketability rule adds an additional standard that is more difficult to prove. If the marketability rule is used properly, as a compliment to the prudent man rule, there is no real reason to apply one rather than the other. As will be illustrated later, the quantum of proof required, not the rule, is the real difference in actions brought by rival claimants rather than the federal government.

Under the 1872 Mining Law, mineral title is transferred to the discoverer of a valuable mineral deposit.²⁸ The promise that they will receive title to the valuable minerals encourages miners to explore the federal lands. Miners are required to prove their discovery because the federal government is unwilling to transfer mineral title to the miner unless there is substantial assurance of compensating public gain in the form of potential increases of available mineral wealth.²⁹

The goal of the 1872 Mining Law is to encourage people to take the risk to explore, find and develop otherwise unknown mineral deposits. For the reward to be effective incentive, less than complete certainty of profitability must be required.³⁰ Therefore, only a reasonable likelihood of economic success need be shown under either standard of discovery.³¹

III. THE SLIDING SCALE OF PROOF REQUIRED TO PROVE THE DISCOVERY OF A VALUABLE MINERAL

The standards of discovery require different degrees of proof depending upon the relative positions of the parties.³² The burden of proving discovery by a preponderance of the evidence remains the same in all cases.³³ However, the type of evidence required to meet this burden varies depending on the class of case presented. The type of contestants are either: rival claimants on the *same* ground for the *same* deposit,³⁴ or the title

27. *Lombardo Turquoise Milling and Mining Co., Inc. v. Hemanes*, 430 F. Supp. 429 (D. Nev. 1977), *aff'd*, 605 F.2d 562 (9th Cir. 1979); *Boscarino v. Gibson*, ___ Mont. ___, ___, 672 P.2d 1119, 1122 (1983).

28. *Wilbur v. United States ex rel. Krushnic*, 280 U.S. at 316-317; *Belk v. Meagher*, 104 U.S. 279, 283 (1881).

29. *Lawson v. United States Mining Co.*, 207 U.S. 1, 13-14 (1907).

30. *See Castle v. Womble*, 19 Pub. Lands Dec. at 957; *Barton v. Morton*, 498 F.2d 288, 292 (9th Cir. 1974), *cert. denied*, 419 U.S. 1091 (1974).

31. *Pacific Coast Molybdenum Co.*, 90 Interior Dec. 352, 360 (1983).

32. *Converse v. Udall*, 399 F.2d at 622.

33. *Foster v. Seaton*, 271 F.2d at 838; *Lombardo Turquoise Milling and Mining Co., Inc.*, 430 F. Supp. at 444.

34. Rival claimants are placer v. placer or lode v. lode on the same ground. If it is placer v. lode, it is not treated under the more liberal rule of the type of proof allowed for rival claimants. *Berto v. Wilson*,

holder and others.³⁵ Proof sufficient to prove discovery between rival claimants will not suffice in cases between the claimant and the title holder.³⁶ But proof that is sufficient against the title holder is good against all others.

This sliding scale of proof is the result of the two different questions to be considered. Where two or more people claim the same deposit, upon ground where they have both found minerals, the sole question is who has the right to develop the deposit. There must be some showing that a mineral was found, but the mineral's value may be inferred from the fact that both want possession of the claim. Thus, the examination of value is of little consequence.³⁷

When the question is whether the miner has obtained title that is good against the government, additional proof of the mineral's economic value is required. Full inquiry into the mineral's value is necessary since the right to own and possess the mineral deposit passes only after compliance with the 1872 Mining Law is shown. Title to the mineral deposit is given on the condition that a valuable mineral has been found with its corresponding public benefits.

The reason for accepting less than demonstrated profitability as a condition to patentability is to encourage the investment of capital and the development of mineral resources. No doubt it would further its purpose to offer the incentive of patentability to "prudent" prospectors as well as "prudent" mine developers. But there are other considerations. A patent passes ownership of public lands into private hands. So irrevocable a diminution of the public domain should be attended by substantial assurance that there will be a compensating public gain in the form of increased supply of available mineral resources.³⁸

Title to the minerals, therefore, is given in consideration for finding minerals having a reasonable possibility of economic return.³⁹

324 P.2d 843, 845 (Nev. 1958).

35. When miners challenge one another for the right to develop land, a grant of mineral title is not involved and the proof required is lower. *Lange v. Robinson*, 148 F. 799, 803 (9th Cir. 1906). Other claimants are grouped together because their right to question the miner's title is based on the government's interest in the land, either as proprietor or original grantor. *Henault Mining Co. v. Tysk*, 419 F.2d 766 (9th Cir. 1969), *cert. denied*, 398 U.S. 950 (1969); *Thomas v. Morton*, 408 F. Supp. 1361; *Alaska Pipeline Services v. Anderson*, 629 P.2d 512 (Alaska 1981).

36. Compare *Lange v. Robinson*, 148 F. at 803, to *United States v. Murdock*, 65 I.B.L.A. 239 (1982), and *Steele v. Tanana Mines Railroad Co.*, 148 F. 678, 680 (9th Cir. 1906). The proof of colors of gold was sufficient against a rival in *Lange*, but insufficient against a railroad entryman in *Steele*.

37. *E.g.*, ROCKY MTN. MIN. L. FOUND., 2 AMERICAN LAW OF MINING, § 35, p. 35-33 (2d ed. 1984).

38. *Barton v. Morton*, 498 F.2d 288, 292 (9th Cir. 1974), *cert. denied*, 419 U.S. 1021 (1974); *United States v. Rizzinelli*, 182 F. 675, 682 (D. Idaho 1910).

39. *Barton v. Morton*, 498 F.2d at 292; *United States v. Rizzinelli*, 182 F. at 682.

Under the policy of the 1872 Mining Law, the value of the minerals found by competing miners is not critical because the one receiving the claim is required to continue to develop the property. However, the mining law does require proof of value when the land will be taken from other uses and the minerals and the right to mine will be vested in the locator.

A. *The Type of Proof Required in Contests Between Rival Claimants*

Even though the proof required in a case between rival claimants is not as strict, the two elements of discovery still must be satisfied. First, a mineral must be found; second, the mineral discovered must be sufficient in quantity and quality to show that this is a valuable mineral.⁴⁰ The value of the mineral deposit can be proved through inference based on known geological facts about the type of deposit and the general area in which it is found.⁴¹ The admissions of the parties may substitute for much of the proof of the mineral deposit's value.⁴²

Even between rival claimants the miner must find more than just general mineralization.⁴³ The exact amount or type of mineral required cannot be set as a matter of law. But, pure inference that a mineral deposit exists, no matter how strong, is not sufficient.⁴⁴

A good example of insufficient proof is found in *Chrisman v. Miller*,⁴⁵ where the first claimant saw small quantities of oil and water seeping out of the ground. The Court held that this showing was not enough to prove a discovery as "there must be such a discovery of minerals as gives reasonable evidence of the fact either that there is a vein or lode carrying the precious mineral, or if it be claimed as placer ground, that it is valuable for such mining."⁴⁶

The proof submitted, taken as a whole, must be sufficient to show "the reasonable hope or expectation of finding mineral in payment quantities."⁴⁷ The proof required is not only proof of the actual mineral found, but proof of "the geology, the locations of other known ore bodies or mines in the area, the opinions of miners, geologists and other experts, and any other information which mining operators regard as having a bearing upon the

40. *Chrisman v. Miller*, 197 U.S. at 322.

41. *Lange v. Robinson*, 148 F. at 803; *Rummell v. Bailey*, 7 Utah 2d 137, 142, 320 P.2d 653, 657 (1958).

42. See *Silver Jet Mines, Inc. v. Schwark*, ___ Mont. at ___, 682 P.2d at 712 (1984); *Velasco v. Mallory*, 5 Ariz. App. 406, 412, 427 P.2d 540, 546 (1967).

43. *Anaconda Co. v. Whittaker*, ___ Mont. at ___, 610 P.2d at 1179.

44. *Id.*; *Rummell v. Bailey*, 7 Utah 2d at 141, 320 P.2d at 656.

45. 197 U.S. 313 (1905).

46. *Id.* at 323.

47. *Murray v. White*, 42 Mont. 423, 433, 113 P. 754, 756 (1910).

possibility of developing a mine. . . ."⁴⁸ This additional proof is often referred to as "geological inference."⁴⁹

The relationship between the extent of mineralization found, the opinion of knowledgeable people, and geological inference can be seen in cases where the minerals found are minimal.⁵⁰ In *Lange v. Robinson*,⁵¹ Lange sought to quiet title to his Alaskan placer claim. The sole question was whether he had proved his discovery. Lange submitted evidence that he had found two to six fine colors of gold per pie plate.⁵² This, by itself, was not enough to show a paying quantity.⁵³

Other evidence was produced in an attempt to show that the mineral deposit found was valuable. This evidence consisted of proof that:

1. The surface showing was the same as that found on lands known to be valuable for placer gold;
2. The geology of the area was such that pay streaks were found at bedrock and that the potential mineral value could not be determined until bedrock was reached; and
3. The geological formation on Lange's claim was the same as that of other claims in the nearby area.⁵⁴

This evidence was sufficient to prove discovery as against a rival claimant.⁵⁵

In *Lange*, geological inference was used to support a minimal showing of mineralization and allow the court to reach the conclusion that there was a reasonable prospect of success in developing a paying mine. It is clear that finding colors alone would not have been sufficient. The additional proof of general geological similarity to other properties being mined was necessary to support the minimal finding of minerals and to show the value of the claim.

Only minimal proof is required to satisfy the value requirements of the discovery standard when the parties are rival claimants.⁵⁶ The presentation

48. *Rummell v. Bailey*, 7 Utah 2d at 142, 320 P.2d at 657.

49. *United States v. Edeline*, 39 I.B.L.A. 236, 241 (1979); *United States v. Marion*, 37 I.B.L.A. 68, 75 (1978).

50. *Henault Mining Co. v. Tysk*, 419 F.2d 766; *Lange v. Robinson*, 148 F. 799; *Steele v. Tanana Mines Railroad Co.*, 148 F. 678.

51. 148 F. 799.

52. A color is a particle of gold found in a prospector's pan. Historically, colors have been sized and converted to estimate value of gold placers. A fine color would be relatively small, probably weighing a milligram or less. J. WELLS, *PLACER EXAMINATION PRINCIPLES AND PRACTICE* (Technical Bulletin No. 4, 1973).

53. *Lange v. Robinson*, 148 F. at 803.

54. *Id.* at 800-801 and 804.

55. *Id.* at 804.

56. *Nevada-Pacific Development Corp. v. Gustin*, 226 F.2d 286, 287 (9th Cir. 1955); *Boscarino v. Gibson*, ___ Mont. at ___, 672 P.2d at 1124; *Parsons v. Kazange*, 158 Cal. App. 2d 779, ___, 323 P.2d 577, 580 (1958); *Lewis v. Johnson*, 132 Cal. App. 2d 635, ___, 282 P.2d 953, 956 (1955).

of self-serving recitals in certificate of location notices⁵⁷ and affidavits, sometimes is sufficient proof that a valuable mineral was discovered.⁵⁸ However, it is risky to rely entirely on these recitals and notices of location. The proof presented should show that sufficient mineral indications were found to make reasonable judgments as to what deposit lies below and its economic potential. One can freely infer the expectations of economic value from these mineral indications, expert opinion and geological inference.⁵⁹

B. *The Type of Proof Required in Contests with the Title Holder and Others*

Stricter proof has always been required when proving mineral title against the United States and other users of the public domain.⁶⁰ The locator must prove that he found the deposit, not just indications of the deposit.⁶¹ Additionally, he must submit proof of the mineral's value.⁶²

1. *The Miner Must Find the Actual Deposit, Not Just Indications of a Deposit*

Proof of discovery in contests between the mineral claimant and everyone other than a rival claimant requires proof of the deposit itself, not just indications that a deposit may lie below.⁶³ Between rival claimants, indications of minerals sufficient to justify expectations of finding a main body of commercial value are all that is required.⁶⁴ Against the legal title holder and others, however, one must find and expose the main body of ore.⁶⁵

57. Location procedures are governed by state laws which generally require that a location certificate be filed in the clerk and recorder's office as proof of the location. ROCKY MTN. MIN. L. FOUND., 2 AMERICAN LAW OF MINING, § 35, p. 33-13 and 33-73 (2d ed. 1984).

58. Nevada-Pacific Development Corp. v. Gustin, 226 F.2d at 287; Silver Jets Mines, Inc., ___ Mont. at ___, 682 P.2d at 712 (1984); Couch v. Clifton, ___ Colo. ___, ___, 626 P.2d 731, 735 (1981).

59. E.g., Lange v. Robinson, 148 F. at 804 (where geological inference was allowed after colors of gold were found); Boscarino v. Gibson, ___ Mont. at ___, 672 P.2d at 1124.

60. E.g., ROCKY MTN. MIN. L. FOUND., 2 AMERICAN LAW OF MINING, § 35, p. 35-34 (2d ed. 1984).

61. Barton v. Morton, 498 F.2d at 289-290; Henault Mining Co. v. Tysk, 419 F.2d at 768; United States v. Murdock, 65 I.B.L.A. at 242; United States v. Edeline, 39 I.B.L.A. at 245; United States v. New Mexico Mines, Inc., 3 I.B.L.A. 102, 104 (1971).

62. United States v. Coleman, 390 U.S. at 602; Converse v. Udall, 399 F.2d 616, 622 (1969), cert. denied, 383 U.S. 1025 (1969).

63. Henault Mining Co. v. Tysk, 419 F.2d at 768; United States v. Murdock, 65 I.B.L.A. at 242.

64. Ranchers Exploration and Development Co. v. Anaconda Co., 248 F. Supp. 708, 714-15 (D. Utah 1965); McShane v. Kenkle, 18 Mont. 208, 44 P. 979 (1896); ROCKY MTN. MIN. L. FOUND., 2 AMERICAN LAW OF MINING, § 35, p. 35-34 (2d ed. 1984).

65. Barton v. Morton, 498 F.2d at 289-290; Henault Mining Co. v. Tysk, 419 F.2d at 768;

The distinction of what must be found is shown in Illustration "1" for lode, and Illustration "2" for placer. In both situations, lode and placer, a miner who has failed to find the lode or pay streak has insufficient proof to show a discovery or submit supporting geological inference. This principle is illustrated by the findings of miner A in both illustrations.⁶⁶ Illustration "1B" represents the finding of an ore shoot or other mineralization which would allow reasonable inference that the main vein of commercial value lies nearby. (Illustration 1B.) This would constitute a discovery as against rival claimants.⁶⁷ However, against the United States it is not a discovery because the vein has not been found.⁶⁸ In contests against anyone other than a rival claimant, the vein, not indications of it, must be exposed. (Illustration 1C.)

Placer deposits are composed of a desired mineral lying loose among other gravels.⁶⁹ Illustration "2" is a schematic diagram of a gold placer deposit with the gold lying concentrated in pay streaks. The pay streaks or deposits lie at various levels within the gravel. Illustration "2B" is similar to the situation in *Lange v. Robinson*,⁷⁰ where surface indications led to inferences of pay streaks at or near bedrock. The mineral indications alone were insufficient to show the discovery of a mineral, but when the inferred pay streaks were included, a discovery good against rival claimants was shown. Against the government and others, geological inference cannot be used unless the deposit is discovered.⁷¹ If the minerals found, in and of themselves, provide sufficient basis for a discovery, then geological inference can be used to determine quantity and quality. (Illustration 2C.)

The illustrations indicate that an adequate showing of mineralization, even in cases against the government, may be achieved with one intersection of a vein or pay streak. One intersection will suffice if the deposit is sufficiently valuable and sufficiently consistent to provide a basis for reasonable inference as to the quantity and quality of the mineralization.⁷²

Montana Cent. Ry. Co. v. Migeon, 68 F. 811, 814 (D. Mont. 1895); *United States v. Murdock*, 65 I.B.L.A. at 242; *United States v. Edeline*, 39 I.B.L.A. at 245; *United States v. New Mexico Mines, Inc.*, 3 I.B.L.A. at 104.

66. *Chrisman v. Miller*, 197 U.S. at 322-323; *Anaconda v. Whittaker*, ___ Mont. at ___, 610 P.2d at 1179.

67. *Rummell v. Bailey*, 7 Utah 2d at 141-142, 320 P.2d at 656-657.

68. *Henault Mining Co. v. Tysk*, 419 F.2d at 768; *United States v. Murdock*, 65 I.B.L.A. at 242.

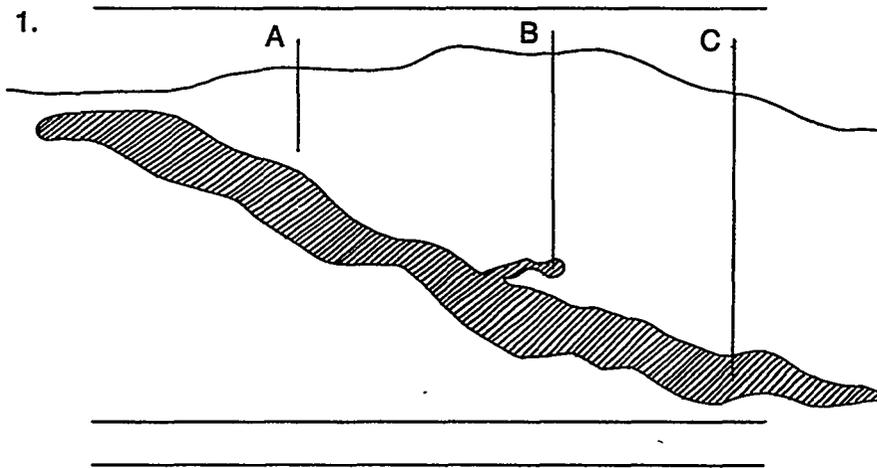
69. *Northern Pacific Ry. Co. v. Soderberg*, 188 U.S. 526, 532 (1903); AMERICAN GEOLOGICAL INSTITUTE, *DICTIONARY OF GEOLOGICAL TERMS* (rev. ed. 1976).

70. 148 F. 799 (9th Cir. 1906).

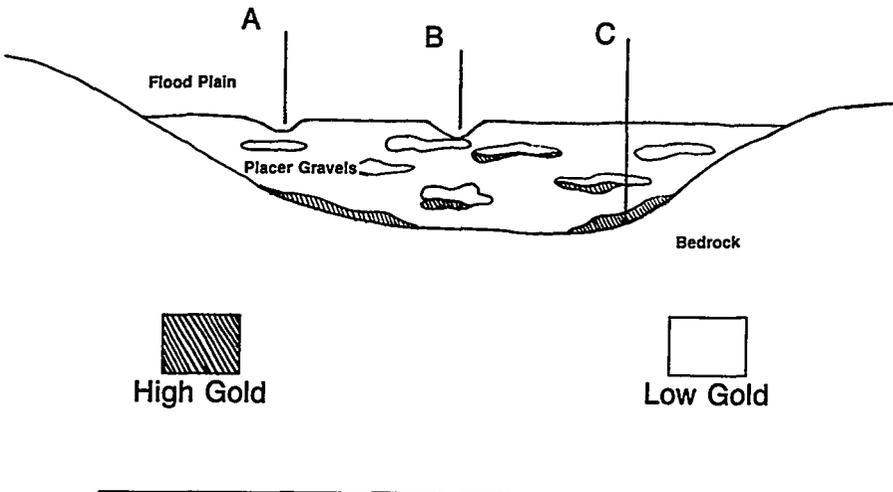
71. *Steele v. Tanana Mines Railroad Co.*, 148 F. at 679; *United States v. Edeline*, 39 I.B.L.A. at 241; *United States v. Marion*, 37 I.B.L.A. 68, 76 (1978).

72. *United States v. Hooker*, 48 I.B.L.A. 22, 30 (1980), *citing with approval*, *United States v. Larson*, 9 I.B.L.A. 247 (1973).

1.



2.



In cases involving "blocked out" or proven ore,⁷³ discovery has never been required;⁷⁴ rather, probable or inferred ore suffices for a discovery.⁷⁵ If the vein or deposit is spotty, with inconsistent mineralization, more sampling is necessary to provide sufficient evidentiary foundation for geologic inference.⁷⁶

Once the mineral deposit is exposed, the samples necessary to prove discovery of a valuable mineral may be taken at a later date.⁷⁷ Samples taken at a later time are admissible only after the claimant has proved that he found the vein or pay streak, not just indications of its existence.⁷⁸ These samples, along with geological inference, expert testimony, and market information, will be used to meet the second requirement; proof that the mineral deposit is valuable.

2. *The Miner Must Show Proof That the Mineral is Valuable*

The second step in proving a discovery of a valuable mineral requires proof that the deposit is economically valuable. Both the prudent man rule and the marketability rule, in contests against the government and others, require a showing that there is a:

[R]easonable prospect that a profitable mine will be developed;⁷⁹

or

Prospect of profit which is sufficient to invite reasonable men to expend their means in attempting to reap that profit. . . ;⁸⁰

or

[A] reasonable likelihood of success that a paying mine will be developed.⁸¹

The prospect of profitability or economic value must be shown as a present fact.⁸² The question of whether something is "presently marketable at a profit" simply means that a mining claimant must show that, as a

73. Proven ore is a deposit which has been sampled on all sides and whose values are known within a 20% margin of error.

74. *United States v. Hooker*, 48 I.B.L.A. at 30.

75. *Id.*

76. *Barton v. Morton*, 498 F.2d at 289-290; *United States v. Edeline*, 39 I.B.L.A. at 245.

77. *Marvel Mining Co. v. Sinclair Oil and Gas Co.*, 75 Interior Dec. 407, 419-20 (1968); *United States v. Converse*, 72 Interior Dec. 141, 146 (1965), *aff'd*, 262 F. Supp. 583 (D. Or. 1966), *aff'd*, 399 F.2d 616 (9th Cir. 1968), *cert. denied*, 383 U.S. 1025 (1969).

78. *Id.*

79. *Barton*, 498 F.2d at 291, applying the prudent man rule to a contest against the United States government.

80. T. MALLEY, *HANDBOOK OF MINERAL LAW* 238 (3d ed. 1983), *quoting from*, *United States v. Gould*, A-30990 (7 May 1969).

81. *Pacific Coast Molybdenum Co.*, 90 Interior Dec. 352, 360 (1983) applying the marketability rule to a contest against the United States.

82. *Hallenbeck v. Kleppe*, 590 F.2d 852, 859 (11th Cir. 1979); *Barrows v. Hickle*, 447 F.2d 80, 83 (9th Cir. 1971).

present fact, considering historic price and cost factors and assuming that they will continue, there is a reasonable likelihood of success that a paying mine can be developed.⁸³

Any showing of profitability breaks down into a showing of quality, quantity, and the cost to mine. This determination should be based upon assays or samples of other observed data. Expert witnesses may be called to extrapolate from the observed data and arrive at final figures. Of course, the observed data must provide credible foundation for the inferences drawn.⁸⁴

The factors inherent in the marketability rule, such as the extent of the salable minerals, the market price of the minerals, and the extraction and processing costs,⁸⁵ are not determined at an abstract, artificial point in time. These factors are instead looked at as a prudent man would examine them, considering trends and reasonable expectations or projections, including structural economic changes and technological breakthroughs.⁸⁶

The data discussed above must be formulated in a way that clearly shows that a valuable mineral was discovered.

3. *The Methods of Proof Available in Contests with the Government*

There are three basic methods of proving discovery against the government:

1. An actual mining operation;
2. A hypothetical mine; or
3. The examination of what prudent men actually projected, considered and did.

The conclusion reached under each method must be that there is some reasonable prospect of developing a valuable mine; a mine that can be operated with a reasonable prospect of profit.

Actual profitable mining operations, of course, satisfy both the prudent man rule and the marketability rule.⁸⁷ However, mines operating at a profit are rarely, if ever, challenged.

The difficult question is whether an operation running at a loss could be a discovery. The answer is yes.⁸⁸ Mines can be operated at a loss without

83. *Pacific Coast Molybdenum Co.*, 90 Interior Dec. at 360.

84. *United States v. Marion*, 37 I.B.L.A. 68, 75 (1978).

85. *United States v. Jenkins*, 75 Interior Dec. 312, 318 (1968).

86. *Pacific Coast Molybdenum Co.*, 90 Interior Dec. at 360. The expectations that future market prices will be profitable must be based on national considerations, not on conjectures and speculation as to possible substantial changes in the market. See *United States v. Denison*, 76 Interior Dec. 233, 240 (1969).

87. *E.g.*, *Rogers v. Watt*, 726 F.2d 1376, 1379 (9th Cir. 1984); *Verrue v. United States*, 457 F.2d 1202, 1203 (9th Cir. 1982); *Adams v. United States*, 318 F.2d 861, 870 (9th Cir. 1963).

88. The Department of the Interior acknowledged this in *Pacific Coast Molybdenum Co.*, 90 Interior Dec. at 360, by noting that mineral prices can fluctuate but this does not invalidate the claim if

reflecting on the value of the mineral or the worth of the mineral product. Poor management, inefficient operations, price fluctuations, and a myriad of other problems plague the business world, and the mining industry is no exception. It is important to determine whether the mine is operating at a loss as a result of business factors or because of something inherent in the deposit.

If the mine is failing because the mineral is depleted or never existed, a discovery does not exist.⁸⁹ But if the mine is losing money because of poor management, then there may be a discovery. The practices of other operators with comparable deposits may be valuable in showing that the inefficiencies are inherent in the business operation, not in the deposit.

A mine also may be operated at a loss for a fairly long period of time as a result of a drop in prices. These mines appear valuable under the prudent man rule or the marketability rule if the price change is short term. A showing of a historic price range and expectations of the price increasing to levels which will render the operation profitable should be sufficient proof of the deposit's value.⁹⁰

The hypothetical market, or paper mine, can also be used to prove discovery. Revenues and costs are calculated apart from any actual plans of the locators. The quality and quantity of a mineral deposit is determined on the basis of exploration and reasonable inference about the extent of the deposit.⁹¹ The mining profits of the paper mine consist of potential revenue less the estimated costs of mining the deposit. The costs must include cost of capital, equipment, reclamation and the like.⁹² The mining industry evaluates the potential economics of deposits in a variety of settings, such as potential purchases, leases, and financing plans. An analysis based on one of these evaluations or methods of evaluation should be sufficient. A completed study of potential engineering costs is not necessary to show a reasonable prospect of profit. Remember that the difference between demonstrated profitability and a discovery may be quite substantial.⁹³

The last method of proving discovery is a showing of what has actually been done, short of actual mining. In terms of the prudent man rule, the

a profitable selling price is within the historic range. A profitable mine is not required, but prices supported only by speculation are not adequate. *Adams v. United States*, 318 F.2d at 870; *United States v. Denison*, 76 Interior Dec. 233, 239 (1969).

89. "It must be shown before a patent is issued that at the time of the application for patent 'the claim is valuable for minerals'; worked out claims not qualifying." *Best v. Humboldt Placer Mining Co.*, 371 U.S. 334, 336 (1963), *quoting*, *United States v. Logonarcini*, 60 Pub. Lands Dec. 371, 373 (19___).

90. *Pacific Coast Molybdenum Co.*, 90 Interior Dec. at 360.

91. *United States v. Alaska Limestone Corp.*, 66 I.B.L.A. 316, 320 (1982); *United States v. Osborne*, 28 I.B.L.A. 13, 44-45 (1976); *United States v. Gibbs*, 13 I.B.L.A. 382, 391-392 (1973).

92. *Id.*

93. *Barton v. Morton*, 498 F.2d at 292.

question is whether the miner invested money and time with a reasonable prospect of developing a valuable mine.⁹⁴ The marketability rule is satisfied if there was a prospect of profit which was sufficient to invite reasonable men to expend their money and means.⁹⁵ The court will be concerned with whether the miners are adventuresome, spending their money without regard to any prospect of profit, or whether they are reasonable men looking for a potential return on their investment.⁹⁶

An inference that the deposit could not be profitably mined is raised by a lack of development or mining activity over an extended period of time.⁹⁷ This inference can be defeated through a showing that work was done with the intent of developing a paying mine.⁹⁸ The claimant's proof of marketability will overcome such an inference.⁹⁹

A miner can successfully prove discovery against the government by using any of the above three methods. A profitable mine does not have to be shown to prove a discovery. As explained above, to prove mineral title of an unpatented claim, or gain legal title by patent, one must show:

1. That a mineral deposit was found;
2. onable geological inferences of quality and quantity of the mineral deposit based upon objective data; and
3. Estimated or actual costs to bring the mineral to market, and expected revenues.¹⁰⁰

IV. CONCLUSION

Regardless of the character of the parties, the standard of discovery is the same. The miner must show a reasonable prospect of success. Though it is easier to prove a discovery against a rival claimant than it is to prove one against the federal government, both contests require a showing that a valuable mineral was found. After a valuable mineral is shown by a rival claimant the court may infer a reasonable prospect of success from evidence of the minerals found, the other miner's interest and the geology of the area. If the contestant is the government, however, then proof of the

94. T. MALLEY, HANDBOOK OF MINERAL LAW 222 (3d ed. 1983) *quoting from*, United States v. Flurry, A-30887 (1968).

95. Barton v. Morton, 498 F.2d at 289; T. MALLEY, HANDBOOK OF MINERAL LAW 238 (3d ed. 1983), *quoting from*, United States v. Gould, A-30990 (1969).

96. See Barton v. Morton, 498 F.2d at 292.

97. Cole v. Ralph, 252 U.S. 286, 307 (1920) stating "it was not intended that a right to a patent could be founded upon nothing more than a holding and prospecting." *Montana Cent. Ry. Co.*, 68 F. at 817.

98. United States v. Harenberg, 9 I.B.L.A. 77, 80 (1973).

99. Rogers v. Watt, 726 F.2d 1376, 1379 (9th Cir. 1984); United States v. Gibbs, 13 I.B.L.A. at 391-392.

100. *Accord* ROCKY MTN. MIN. L. FOUND., 2 AMERICAN LAW OF MINING, § 35, p. 35-61 (2d ed. 1984).

operation's potential profitability must be submitted.

Because it is easier to prove discovery in a contest with a rival claimant, the miner finds himself protected from intrusion from other miners while he explores further. As he explores further he may find the vein, the discovery of which will allow him to prove discovery against the government. However, until he finds the vein, the claimant only has a possessory interest. If he does find it, his right to possess and mine the minerals cannot be taken by anyone. In this way, the 1872 Mining Law provides miners with an incentive to find valuable minerals, reasonable protection while searching for mineral deposits, and a guaranteed reward when a discovery is made.