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Gold SLAB

VALLEY ASSAY OFFICE

AND ORE TESTING LABORATORY

MEMORANDUM OF ASSAY

Made for Ray Hollenstein ______ Tempe, Arizona, Jan. 18 , 19 67

SAMPLE No.	PER TON OF 2000 POUNDS AVOIRDUPOIS								COPPER			LEAD			TOTAL	
	GOLD				SILVER											
	At [illegible]				At [illegible]				At [illegible]			At [illegible]				
	Ozs.	[illegible]	[illegible]	[illegible]	Ozs.	[illegible]	[illegible]	[illegible]	%	$	cts	%	$	cts	$	cts
-92 →	0.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	00	16	64	.9	14	44	28.9	84	99		
									[illegible]			0.[illegible]	[illegible]	10		
															[illegible]	88

REMARKS:

No. ______ BY ______

Registered Assayer

CHARGES 10.00 Pd.

REPORT OF INVESTIGATION
(FEASIBILITY)
of the

ROADSIDE MINE
(and including ~~claims~~ Gold Slab claims)

LOCATED IN MOHAVE COUNTY
ARIZONA
LEGAL DESCRIPTION AS LISTED

SEC. 11, T 21N, R 21W— SEC. 12 T 21N R21W, G&SRB&M

1. LOCATION
2. ACCESS
3. PROPERTY DOCUMENTATIONS
4. HISTORY AND OBSERVATIONS
5. CLIMATE, WATER, VEGETATION
6. GEOLOGY
7. MINE WORKINGS
8. ASSAYS
9. SUMMATION, CONCLUSIONS, RECOMMENDATIONS
10. SAMPLE LEACH SCHEME (with flow sheet)

by,

WARREN NOEL, B. Sc.
REGISTERED MINING ENG.
Rt. 3 Box 14 SLOAN, NEV.

LOCATION

The mining property investigated in this report includes (4) four parcels. The GOLD SLAB claims # 3, 4, 7, 8, which are all located in Secs. 11 & 12, T21N, R21W. These are contigemous to the primary lode claims known as the Roadside and located as such. No survey discrepancies were found, however a check with the survey records chief of the Bureau of Land Management in Phoenix, Arizona disclosed that all sections pertinent to this location have been surveyed and are in order. This is no doubt due to the close proximity to the Lake Mead Recreation area, a Gov't. park which usually leave no margin for error.

ACCESS

Topographically, the mine is situated due east of Katherine Landing, Lake Mohave, Arizona on the Colorado river extension area of Lake Mead Recreation Area. In distance it can be reached by driving east from Davis Dam to the Katherine Landing road. Upon reaching the road, turn left and proceed for approximately four miles northerly until a well traveled graveled road is reached where you will turn right. This is the old county road to Kingman the center of all major legal activity due to it being the county seat however, Bullhead City just south along the river about three miles has grown in the past few years to a dimension that it may very well have services available that they do not have in Kingman. After turning right on the county road you will proceed east for four miles on a fairly good gravel road at all times bearing to the right. The mine camp and workings are evident at this point immediately to your left. The parking area and small trailer camp is located 100' off the road and are kept in an orderly condition at all times. From this point the Lake or Colorado River can be seen at all times which makes this mine rather unique in that it isn't too far from civilization, a point to consider where economics are concerned.

Another major consideration is that all of the roads up to and on to the mine property can be negotiated with any type passenger car and other than perimeter of the property, four wheel drives are not necessary which is not the case on most mine properties.

PROPERTY DOCUMENTATIONS

A trip to the Mohave County Courthouse in Kingman, Arizona for the purpose of inquiry and records search disclosed that all are in good order. This includes all ammendments, proofs of labor, and all recordations necessary to accomplish ownership of a mining claim in accordance with federal mining regulations of 1872, Title 43, parts #3850, #3830, #3840. This also includes Arizona Mining Statutes in addition to those covered in Title 43, U.S. Gov't. regulations dated 15 July, 1971 with no revisions pertinent to these matters.

HISTORY AND OBSERVATIONS

Documented history, I have found, only serves as a rule of thumb when researching for the purpose of determining such information as past production, the actual grade of ore, etc, not to mention the actual reason a particular mine shut down, or has not reopened. As a rule, history only tells you what is recorded not why it is recorded. In view of my attitude concerning this I will mention that a good portion of my research, perhaps 25% or so, was spent talking with persons who had family members either working in this mine or the mill serving it. During the past 25 years I believe I have found as many errors in regulated and filed history as I have in so called "tales" from the miners who were there and I find it much easier to look a person in the eye while listening to some history than I do to keep tongue in cheek while reading it. In this particular case the production records are only as authentic as they were kept but we will get into that a little further along.

observations continued

1915 is the first recorded history of the mine as such however, the origin of primary vein structure is no doubt from the Sheeptrail Mine which dates back to 1868. The Roadside mine was worked as a property even then but probably not as the Roadside per sie and probably not even as a mine. It was probably worked as a "glory hole" which is the term applied to a rich area that can be worked without milling the ore to recover the values. That is to say that the gold or silver is so visible and free that it can be picked out after breaking it loose from the rock. Many properties have been worked this way in the past and it was about this time 1868 that two miners from the neighboring areas of Nevada were working both banks of the Colorado River for high grade areas such as this. The Roadside did miss their scrutiny for awhile however but when the big effort by the Union started to bring an end to the Civil War a concerted prospecting program was put forth by all of the prospectors in the region to mine and send back to Washington, as much high grade gold and silver as they could find. It is a matter of history that they succeed because the money derived from these metals was the deciding factor in ending the war. The names of the two miners who were so successful in their prospecting endeavors were Yount and Stewart who went on to discover and develop one the most famous mining districts in southern Nevada, the Goodsprings Quadrangle. They were not amateurs so the lenticular vein makeup of the Roadside probably made for good pocket hunting and once they learned how to identify it as such it was a simple matter to exploit it. In some of the back areas of the property yet, there are a few diggings that are obviously not exploriation holes and it is reasonable to think that they may have been left by our two old timers, Mr Yount and Stewart because values can still be assayed from the surrounding debris. The activities of these two

observations continued

gentleman working in the Katherine district is verified by records of the Nevada Historical Society, the Hewitts report written in 1916 by Dr. C. Hewitt for the U.S.G.S. and the Nevada Archives. It appears that history of the individuals disclosed more information reguarding this mine than history of the mine did as I was to learn because in this district, mining records seemed very vague and in some cases incomplete. This is where the difficulty comes in always when trying to establish a mines birthdate so for the benefit of propriety, we will consider 1915 as the Arizona Bureau of Mines records show. A point of interest is that if this property was good enough to walk to or ride burro or horseback to, then it must have justified itself. All records researched from the Bureau of Mines show a return of values in excess of one quarter of a million dollars taken from the Roadside mine. These were all from gold and silver only because the mill system that the ore was sent to for recovery was not tuned for values other than noble metals as was often the case in the past. I will note at this time that during my assay testing of the property it became obvious that other values were evident on the property but at this time they are of no interest to me for reasons other than academic. The Sheepmill mine mentioned before is considered by most geologists to be the primary or apex zone of the entire area. I do not agree nor disagree because I have not done enough basic examination of the surrounding properties and furthermore the geological possibilities do not interest nor hold any great appeal for me because my only interest is with what I have been witness to. My additional enthusiasm is no doubt due to the fact that the values taken from the Roadside mine were taken over a period of years but because of its erratic history never ran for a period of

observations continued

time beyond eight or nine months from an operation. How many tons of ore actually removed from the mine or even over what period of time it was taken from cannot be established as fact because records do not always state this information. In this case simple mathmatics and a little horsesense will come about as close as anything. The amount of ore or footage removed from the underground workings as opposed to the exsisting waste pile plus the ore that was recorded as being shipped to the mill not to mention the production capacity of mill just do not jibe in this case. Either the ore was a hell of a lot higher in grade as shown, or the mill recovery system was poor, or the various companies enjoyed a rather high percentage of high graders I would rather think that numerous pocket zones were discovered but more than likely a little of each condition exsisted. Mr. Oscar Hershey, a noted mining engineer of the early 1900's has written three reports on this property, one of which I have had the opportunity of reading. The other two are a matter of his estates records from which I have requested of from the family. He states that it would be difficult to coorolate past operations of this mine due the vast number of owners and/or operators. To this I completly concure because I cannot remember researching a property that has had quite so many persons involved in its history. But as Mr. Hershey states , this is all a matter of record and of no real importance. Many, or most of the past operations appear to have failed thru lack of adequate funds. That is to say that the required funding was probabley available at the start of a particular operation but rather than continue from where the prior operation had left off, it appears that they all started entirely new operations thereby deriving no benefit of the prior operators mistakes or advances. This is not a unique situation, rather, it is quite common in mining

observations continued

even today because unfortunately most miners and mining engineers alike are very opinionated and do not like to be directed. In this particular case, no less than eighteen various type recorded documents were researched including newspaper files, verbal contact, the usual courthouse files. Of those found to be legitimate operations, only four of them shut down because of national economics and in one case, a Presidential order closing all non strategic war material mines down during World War II. Obviously then, the mine didnt fail,------,the the persons involved did.

CLIMATE, WATER, AND VEGETATION

The region is situated on the eastern banks of the Colorado River and could be considered as having been at one time, part of the high Mohave desert. It enjoys a rather mild climate but due to the Colorado river becoming Lake Mohave at this point, the humidity factor is rather high. During the short winter months the temperature may range from the 20s to the 40s but during the summer months, the high 80s to 100 plus is the rule rather than the exception. The long spring and fall seasons are exceptionally mild and would make over all ideal year around working conditions. Due to some rather steep mountain slopes, mostly devoid of any soil other considerable alluvium, the runoff from rainfall is high and only a small fraction of moisture is retained to support a sparse but wide variety of desert vegetation. Close inspection will disclose that there is a decided alignment of plant life along the soft less resistant beds including vein structures, faults and some jointing in the harder rock. No doubt , there is some coorelation between this condition and the obvious vein structures which could partially account for the past discovery of numerous pocket zones at depth.

ths of up to 300' which would be considered shallow , geologically speaking. Water appears to be abundant in the general area however past operations have been served by normal mine seepage only. Domestic water is available around 200' according to the Water Resources Division but palatable water is being pumped from numerous wells in the vacinity and is available for domestic purposes and required camp needs which would not be great.

GEOLOGY

The purpose of this report was not for geological determinations to date the area which is undoubtedly Paleozoic for the most part. This has been done many times in the past and each time researched and substantiated. My observations were cursory but necessary for my own benification. I observed nothing I considered dramatic but other than the obvious conclusion that the basic formation was all gold bearing and appeared to be quite saturated with other mineralisation. It also appears that the parent (country) rock formation is just a simple conglomerate of Rycolite and Granitic Gneiss, attractive from vein structure identification however. The veins appear constant with irregular shoots of quartz calcite combined with silecieous ryolite and there does not appear to be any defined vein as such however, the lenses themselves can be defined as a vein however small or concentrated they may seem. Lenticular ore bodies are sometimes called chutes, chimneys, lenses, kidneys, etc. and in the past were often mined for the values within these particular areas only with no thought of any value between the zones. In other words, if it wasn't visual or as the term goes "seeing gold", then it just wasn't there. After awhile it became evident that the zone between such as the kidneys etc. could and usually would carry as much and even more in dissiminated values in micro size. I believe this to be the case at the Roadside Mine

Geology continued

because there does not appear to be any area of unmined ore remaining within the mine proper that is completly devoid of values. The general,area can not be termed as a simple geological formation because there is definite complicated system of faults, each independent of the other. The mine proper itself, or at least what I would consider the Roadside mineral zone appears to be gossened with debris extending to all points in a definite pattern as if it were forming an ore body rather than a zone. This is an ideal situation if it holds true throughout the mine proper and the possibility is as positive as it is negative. Most of the ore as such occurs as a yellow, waxey quartz, shot with what identifies as dendritic manganese. This material pans well and without benefit of this knowledge I may have passed this by as being ore in spite of its quartz content. It is my considered opinion that an extensive geologic study between this mine and the Gold Road district around Oatman would reveal the same tectonics even to the point that the ore zones are one and the same. This opinion is shared by other Engineers and Geologists so I am not unique, nor am I a strong geologist.

MINE WORKINGS

Naturally, the important point regarding the exsisting workings is what are still useable or better still, what part of the mine as it is will come up to todays safety standards? Has water caused loosening of the ground? Has exposure to the elements over the years caused excessive air slackening thereby creating a dangerous mine that would not pass safety standards? To answer these questions honestly and without conjecture could only be don under operating conditions and that naturally means reopening the mine. As I have stated earlier, water is the basic fill in the deeper workings of the mine due to natural seepage. This is not to mean that it cannot be used to

an advantage nor does it mean it can not be pumped down. Today rather than yesterday most watered mines can be pumped down in a matter of days and even hours especially when the condition is caused by seepage which is normal and usually beneficial where dust is a major factor. With the exception of the immediate portal area (entrance) which has too much open ground exposed and would not pass the Bureau of Mines safety standards, the mine proper and workings are in better than average condition and should remain that way. Minor clean up, barring down of loose rock, and support where necessary with timber as required should make it a safe mine well within standards. The portal area mentioned before would have to be collapsed but this not a major task and would no doubt even create some additional values because the original shaft was sunk on high grade ore as evidenced and the collapsing would recover this area that was not taken in the beginning. The mine was operated for the most part using the shrinkage method. To explain this it is meant that a high or a mid grade area was mined through in the stope (room) manner but leaving support pillars during mining operations. When the stope area was completely exhausted of ore then a retreat was made by (pulling) the pillars which were of equal grade as the ore removed. At this point nature took over in the form of gravity and the unsupported weight would cause the stope to collapse thereby filling the cavity and eliminating a dangerous area. This is good mining practice as was evidenced throughout the mine. There are still a number of stopes remaining in the Roadside that would justify pulling and it would be this writers intent to do as much if he were to operate the mine. The shaft at 300' depth would lose no working areas by collapsing the portal, on the contrary, it would bring the first working level closer to the surface. The first level is reportedly one of the better levels as far as values are concerned having produced in excess of 2000 tons of ore averaging $12.00 per ton in value durinh 1919. By

Mine Workings continued

today's standards that would amount to a considerable amount more. Up until July of 1935, probably 1,500' of usable workings existed. To this date, perhaps 200' or 300' more has been added by various lessors or owners but nothing more appreciable than that. It would be safe to expect that 80% of these workings can be safely used today.

ASSAYS W/ CURRENT VALUE PROJECTIONS

A total of nine (9) samples were taken by myself and a qualified assayer from the pillars and the available wall rock. Each was taken in the accepted manner not to be influenced by high grading ones self. They were taken in a channel cut manner for distances up to 10' and in the case of the pillars, the entire circumference where possible. Each sample was ground and quartered and half of each was added to a common pile for a composite of all. This I believe to be necessary where cyanidation is being considered. The balance was run for assay by individual samples and all pulps were kept for a cyanide test to determine the practability of heap leaching this ore with cyanide. Below are the results by sample mark number;

	Gold (Au) Ozs.	Silver (Ag) Ozs.
1. Cntr. Pillar	.77	2.37
2. N/W Pillar dr	.68	3.58
3. North Pillar dr	.43	3.16
4. Wall Rock N.	0.025	4.77
5. Wall Rock W.	.14	2.25
6. Wall Rock S.	1.17	1.19
7. Compos. Port.	.67	3.26
8. Compos. Drift.	.38	2.67
Port. Stope Comp.	.24	1.86

The cyanide test showed the ore to be completely compatible with the NaCN and CaO solutions however, quite extensive experimenting was required but this is not unusual. Most of the ore in this particular part of the United States can be classed as of the simple variety and because of this, cyanidation has never has posed a problem where it could if the ore was considered complex. I consider this test merely a confirmation rather than a necessity. Further, I will not incorporate the results of each individual sample as such because I do not feel that they are representative of the mean and will only tend to mislead, lead. I might also add that I felt there was no purpose in reducing each result into monetary terms as the day to day change in the market has been so erratic lately and again, would only tend to mislead.

Summation, Conclusions, and Recommendations

From a casual look in passing by the Roadside mine via the county road it is difficult to imagine the potential of this property unless someone has at least a working knowledge of mining all of its aspects. Imagination and vision are also important and I believe I have both, ——— I would not be a mining man if this were not the case. I have just recently returned from the interior of Mexico having spent the better part of two months evaluating and setting up a Gold and Silver operation for a group of American investors who will no doubt realize good returns on their investment. At the completion, I felt that I had been involved in the best mining venture of my career which is going into its 26th year but I will now reconsider and state that it was probably only one of the best, the Roadside and its properties potential probably being equal. As stated before, mining people especially Engineers are opinionated. I am no exception and I will base all of my conclusions solely on opinion, be it fact or conjecture.

summation continued

In comparing the Roadside with Mexico I can only state that after all considerations are made such as comparing a domestic operation as opposed to a foreign operation, the proximity to all necessary services and supplies as opposed to an extremely remote area where nothing is available. There was probably a little better grade of gold in Mexico but not nearly the quantity so in view of all of these factors it isn't really too difficult to be realistic and decide pro Roadside. During the course of investigation the most interesting part is usually the question and answer period conducted between myself and the past and present participants of a property. Sometimes this involves an Uncle or a Grandfather twice removed. Occasionally he just passed away a year or so ago but once in awhile you luck out and get to talk to the " horses mouth " so to speak. This happened to me on two occasions in researching the Roadside and I consider it fortunate because the information gained came to me first hand rather than second hand. During the week of Sept. 9, 1976 while doing records research for the report at the U.S. Bureau of Mines in Reno located at the Mackey School of Mines, University of Nevada, I chanced to meet a retired mining inspector who was aware of the Roadside mine and vague portions of its history. He was acquainted with a man living in the Silver Peak area of Nevada, a mining community, who worked at the Roadside as a very young man in the capacity of toplander. A toplander is a glorified laborer, nothing more, but they usually get involved in most phases of the operation at one time or another. In February, 1921 R.W. Shaw took a contract from the owners of the Roadside to operate the mine. He had a nephew named Samuel who hired on as a toplander and this is the man I was directed to talk to at Silver Peak. Sam Shaw is quite vivid in his recollection of working for his uncle, the most vivid being the areas he occasionally worked in underground when someone didnt show up for their shift. He spells out in detail how he has [illegible] silver exposed in some of the smaller stopes

on the 1000' level. He also remembers why the mine folded under his uncles direction. The financing behind R. W. Shaw came from a group of eastern investors and it appears that they all either had a relative or friend that they wanted to put to work at the mine. As Mr. Shaw puts it, probably to watch their investment and report back to them, but in any case it was doomed from the start because a mine like anything else and even more so, can not be run with inexperienced hands and it soon closed down because of lack of funds. My best source of information came from someone whom my wife and I had known for many years, but who unfortunately has been deceased for a number of years. Annie Rader was known as the matriarch of Oatman, Arizona one of the most famous of the areas mining camps not to mention one of the wildest. She arrived by stage as a young schoolteacher from Ohio but soon found out that she was not quite as dedicated to teaching as she thought she was. Around 1918 after waiting tables in the miners boarding house she had the opportunity to buy it from the owner who had ill health so a local businessman backed her and she bought it. After changing the format a little by the addition of a few young ladies, she soon had her own gold mine. It was and still is common practice for business people in mining camps to extend almost unlimited credit to mine companies and their employees and with her boarding house feeding half the miners in the area it was not long before she had a quite a few shares in the mines in the district in lieu of payment. The Roadside did not escape her and at one time she had the opportunity to take the whole thing over because they had not paid her for so long. A supplier from Kingman came to their aid and paid off most of their debt to her but she retained a few shares on the chance that they would pay off, which eventually they did. In 1967 she was asked by the editors of True West Magazine and Frontier Times to write a few short stories regarding Oatman which she did. I helped her do some

of her research and it was then that I gained as much information as I could regarding mines in the area. I remember some documents she had that at the time of the issue of them they were considered confidential information. I do remember that they applied to various areas of the mine that were extremely high grade and production was being pushed in this particular zone but that the ore was not to go to the mill. That only tells me one thing, unrecorded production. As mentioned before, too much research or too much opinion or even enthusiasm will only tend to make conclusions or recommendations more difficult so I will continue now with recommendations concerning the recovery of values from cyanidation.

Before any work is progressed in any underground workings of the mine, a preliminary leach pad should be constructed for the purpose of evaluating for extraction of values from all waste and alluvium in the vicinity of the shaft area including the mine dumps. This would also facilitate all ore removed from the portal renovation mention earlier. A tonnage factor of well over 150,000 tons would be realized in doing this and with very little actual mining. This figure is actually conservative as this would depend on how much ore was collapsed from the original area which could be a gross amount. After this is accomplished then the ore from actual mining operations can be processed on an additional leached pad circuit. In doing it in this manner the primary leach pad can be an immediate investment return at least to a point of self sufficiency and would also serve as the test pad for future ores from the underground workings. Chemical formulaes will have to be ascertained and balanced anyhow and I cant think of a better way to do it than have it pay for itself.

I will briefly discribe the history of cyanide leaching and the benefits of it. The earliest commercial application and actual

development of the process is attributed to a Scotish chemist by the name of John McArthur working with the Forrest brothers who also dabbled in chemistry but who were not quite as proficient as McArthur. They worked and experimented from 1887 until 1890 when they had a chance to introduce it into South African gold mines. From there it didnt take long to spread to Austrailia, Mexico, and then to the United States where it caught on much more rapid because of the availabilty of necessary chemicals. At one time or other it has been used in most major mining operations in the world. So you see, it isnt a new development. It was even used the Egyptians but was never fully developed nor even simplified by them. Some historians speculate that perhaps the word Cyanide scared them but I rather doubt that. The reasons for the wide spread acceptance of cyanidation are both metallurgical and economical. It normally obtains a higher recovery rate and the final form of the product is usually in the form of practically pure metal. Thus the production from a large cyanide plant is usually represented by a bar of pure gold and/ or silver which is easy to market and transport. However simple that it appears though, it cannot be over simplified. Here again, if todays refinements and sophisticated are not incorporated, then the system is usless. Most of the past cyacide plants if not all were closed circuits which in most cases created a restriction where gross production was concerned. In other words, no more could be leached than could be processed and pulverived. Today, it is not uncommon to see a quarter of a million tons being leached at one time. There is even talk of a half million tons and in most cases without benefit of grinding although minimum results are usually obtained with this method. Cyanide is the general discriptive term applied usually to sodium cyanide (NaCN) and the strengths of solution as well as the basic formulae are in terms of the chemical.

Recommendations continued

The basis of the process is that weak solution of an alkaline base cyanide have a preferential dissolving action on small particles of metallic gold over other metals usually found in gold ores. Silver reacts in most cases, the same as gold however the occurance of silver as an obvious metallic is not common. Normally, it will occur as a sulfide. Below is a brief circuit showing the method of heap leaching as done today. Refinements are always optional but not always necessary because once the critical point of chemical penetration is attained then time takes over and any imbalance either plus or minus will only deter or even stop the precipitation process. By the numbers, the system [illegible] follows this sequence:

No. 1 [illegible] Mixing Tank

Liquid solutions (H2O) are mixed with NaCN to a point of Ph 11. This is a rule of thumb however, the Ph factor can vary from as low as 6 to a high of 11 which is considered ideal for optimum recovery and [illegible] established as average by the Bureau of Mines. In most cases depending on CaO content in solution primary (H2O), lime must be added. In solution to standards, this material is pumped to the No. 2 operation.

No. 2 Basic Leach Pile or Pad

This is the primary center and purpose of the whole operation, everything starts here. The schematic shows this as a top view but from a side view or crossection, a better prospectus can be had. The ore is ground to a plus or minus ½" factor and deposited on the pad. to a depth of perhaps 18 to 20 feet in a perimid manner to eliminate runoff. This should cover the complete pad, in this case 60 by 100 feet of which probably 50 by 90 feet is useable. Jointing and slopes account for the loss in workable area. The fluid or solution is carried from operation # 1 by pump up thru the tubing which is shown in

[illegible] continued

black. Up over the top of the piles the tubing is perforated and the fluid under pressure from the pump is sprayed over the piles of ore to accomplish complete saturation of the product. Around the perimeter of the pump, a dam is built with waste material in a coffer manner. This is necessary to contain the solutions and also to eliminate any erosion of materials. Normally, from 48 to 72 hours are required to completely [illegible] the product on the pad but this is determined by the depth and grind of the material. The tenor of the ore could have some [illegible] on it but this is not the case with Roadside. If it were, it would only increase the time in circuit to complete precipitation. Once precipitation is effected, the process of value extraction starts and [illegible] as long as a chemical balance is maintained, often as long [illegible]. Periodical solution checks are the rule in this case.

No. 3 Clarification Pond

[illegible] the leach pad gravity takes over and the solution flows through [illegible] into a clarification pond where it is allowed to settle and [illegible] itself of any foreign materials. It must be remembered that [illegible], precipitation has been effected and the solution has become [illegible] with noble metal values in the form of micron particles. Contrary to normal thought, the values will not sink to the bottom as one would think because they are kept in suspense by the formulation of the cyanide etc. as the principle intends.

No. 4 Thickener Tank

From the top of the clarification pond the material is pumped to the thickener tank which agitate's the solution with nec. additives to complete the conditioning the pregnant solution. This could be the end of the process before the filtering and final stage as the thickener only serves as a final residue wash and countercurrent decantat-

Schedule Continuation

No. 5 Filter Press or Recovery Chambers

Filter pumps now transport the material to the filter presses which are charged with whatever component core is applicable to the ore. In this case and after one cyanide test it appears that coconut charcoal is adequate but I would not conclude on the results of one test. Many agents are available and would apply to this ore but the overall economics and compatability with the system will have to be studied. At the completion of this part of the circuit the material become a product. It will occur as what is considered Liquor, Matte, Sponge, or a Bullion. The end product can only be determined after buyer requirements are established however any product can be obtained with the various refinements at hand and available. Electrowinning can be added to the system that would allow complete processing [illegible] to most elaborate mill systems but there again this requires [illegible] research. Any of the above products are marketable and offer [illegible] range of purchasers ready to receive them. Naturally the bullion product is the best and would without doubt justify the expense of the incorporation.

The results of the essays taken by myself only confirm for my own consideration those taken by Mr. Paterson and various other persons in the past. On the basis of those results and considering the past performance of the Roadside mine and the knowledge I have gained by personal inspection and research it is not difficult to recommend this property for immediate developement. As a rule, developement is not recommended first. Most Engineers including myself will commit themselves only after recommending further tests, sampling, and usually an extensive drilling program. This is not to say that these phases would not be required as an operational standard but I do feel that funding of this operation will more than justify itself. An ob-

Conclusion

jective view can be taken if one would consider the results of a study made and definite conclusions drawn by the U.S. Bureau of Mines in their Salt Lake, City Metallurgy Research Lab. Under the directorship of G.M. Potter and H.B. Salisbury two of the countrys leading Metallurgists and authorities on cyanidation, the lab has established and published proof that up to 95% recovery can be obtained of values from ores containing no more than 0.06 to 0.6 in gold by assay. The is constantly averaged, ounce to the ton. I have found no area in the Roadside where the gold ran that low however I know I could if that were my objective but why I look for lesser grade material? These results probably only confirmed what some advocates of cyanide have known and been doing for a long time but to be confirmed and sanctioned by the Bureau of Mines is in itself quite an accomplishment and only adds to the attractivness of the proposition. The efforts of these two gentleman are to be lauded because their confirmation helps minimize the risk in any consideration of the system.

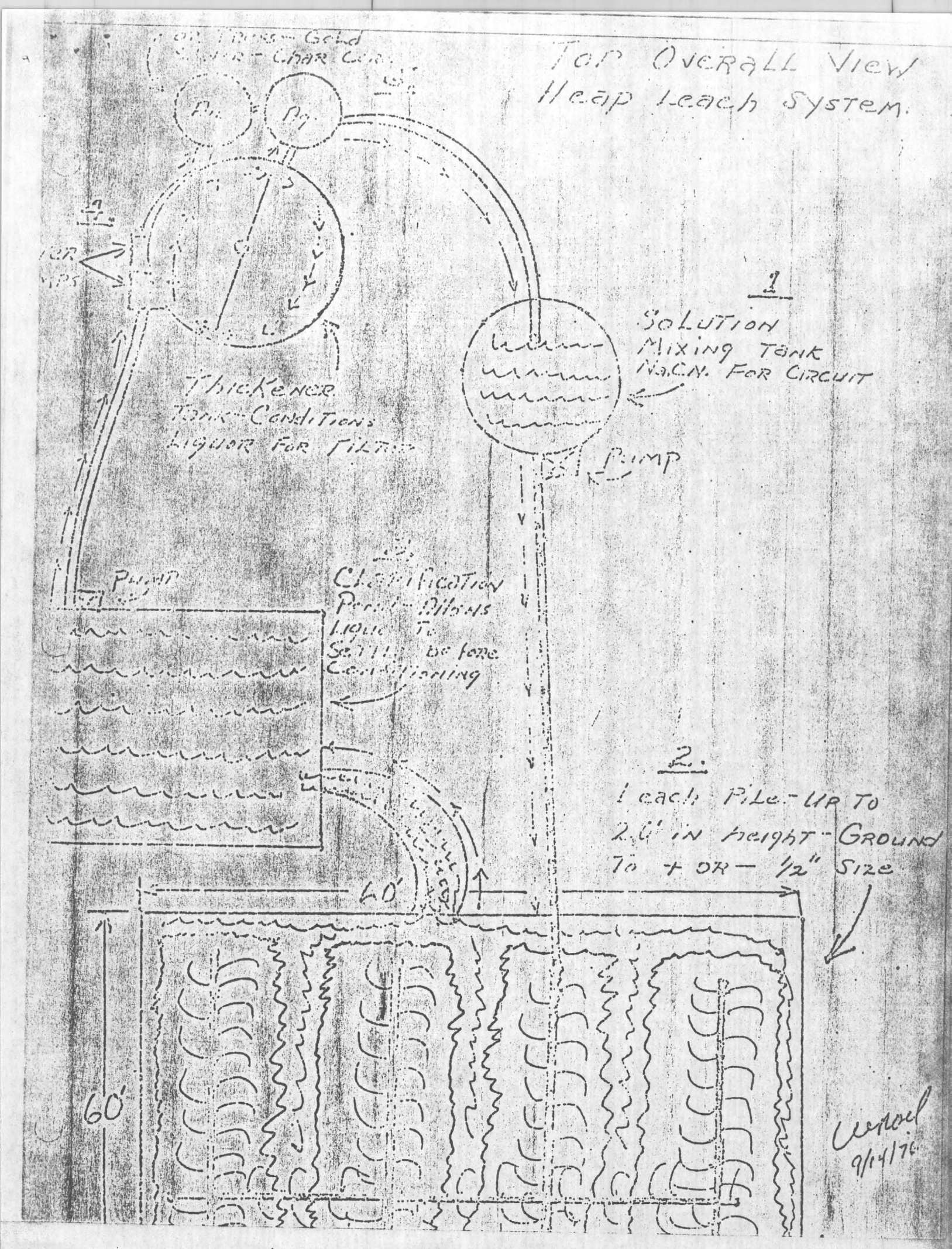
I will concentrate on my recommendations requarding a start of any operations at the Roadside Mine:

1. Commence mining by collapsing all exposed ore at the portal and adjacent areas.

2. Construct a leach pad and install all necessary increments of machinery such as crusher, loaders, drills etc.

3. Without appearing to oversimplify, this concludes the report and recommendations. The schematic drawing is taken from a heap leach operation that is presently producing and can be inspected at any time with permission. It is located 30 miles east of Fallon, Nevada and operates seven days a week.

Respectfully Submitted,


Top Overall View
Heap Leach System.
Thickener
Tank-Conditions
Liquor For Filter
Pump
Pump
1
Solution
Mixing Tank
NaCN. For Circuit
Pump
Clarification
Pond-Allows
Liquor To
Settle before
Conditioning
2.
Leach Pile-Up To
2.0' in height-Ground
To + or - 1/2" Size
60'
60'
9/14/76