The HB Solar Solution Mine Project

Subsidence Monitoring and Mitigation Plan

Revised

March 9, 2012

Intrepid Potash – New Mexico, LLC

Carlsbad, New Mexico

Table of Contents

Table of Contents (continued)

Figures

Tables

Appendices

1.0 Introduction

The HB Solar Solution Mine Project (HB Project) is a solution mining and solar pond evaporation project being proposed by Intrepid Potash – New Mexico, LLP (Intrepid) adjacent to the Intrepid West Mine facility within Eddy County, New Mexico. The solution mining operation would occur on the Intrepid Federal, State, and fee potash leases and would include the HB Crescent, HB North, HB South, and HB Eddy mines (HB Mines).

Subsidence has already occurred as a result of conventional mining in the HB Mines area. There is potential for additional subsidence as a result of solution mining, although to a significantly smaller extent than from the subsidence that has occurred as a result of conventional mining. A detailed analysis of subsidence from conventional mining and the estimated potential subsidence from solution mining has been completed by RESPEC Consulting and Services (RESPEC), Rapid City, South Dakota. Based on the results of the detailed analysis, this subsidence monitoring and mitigation plan has been prepared to describe subsidence monitoring for the planned solution mining and proposed subsidence mitigation related to solution mining.

2.0 Description of Project

The HB Project consists of flooding existing, idled underground mine workings using an injection/extraction well network and associated piping, a series of solar evaporation ponds, and a new processing mill for purposes of producing potash from the remaining pillars and fringe ore in the previously conventionally mined underground works.

The solution mining operation would occur on the Intrepid Federal, State, and fee potash leases would include the HB Mines. Groundwater would be pumped from the Rustler and/or Caprock formations for use as injectate make up water. The groundwater would be conditioned by adding salt from Intrepid's West Plant salt tailings and/or recycled salt derived from the new flotation plant (HB Mill) to form an injectate that is saturated with respect to sodium chloride (NaCl). Brine solution would be injected into the previously mined workings through injection wells. The injected brine would fill the lower elevations to a pre-determined maximum elevation of the workings and selectively dissolve potassium chloride (KCl), or potash, from the remaining pillars and fringes of the workings. The resulting potash and salt concentrated solution would then be recovered via extraction wells and pumped through pipelines to solar evaporation ponds located in Section 2 adjacent to the Intrepid West Mine facility. Evaporation of the brine would cause the KCl and NaCl to precipitate out in the solar evaporation ponds. This precipitated product would then be mechanically harvested from the solar evaporation ponds and transferred to a slurry pit/pump box within the lined solar pond facility and mixed with brine to create a slurry. The slurry would be pumped through a pipeline to the new HB Mill (to be constructed adjacent to the existing West Mine facility). The KCl and NaCl would be separated in the new HB Mill using an amine flotation process. After flotation, standard classification, filtration and dewatering methods would be applied to further concentrate the solid KCl product before it is transported from the new HB Mill to the existing North Mine facility for further drying, grading, preparation, and load out for commercial sale. The NaCl by-product from the flotation process would be used to salt-saturate the injectate brine. Any excess NaCl produced during operations would be sold as a commercial product (solar salt) or disposed of underground.

The HB Project area is located approximately 20 miles east of Carlsbad, New Mexico. The project area includes the HB Mines located in Township 19 South (T19S), T20S, and T21S, Range 29 East (R29E), R30E and R31E (New Mexico baseline and meridian), Eddy County, New Mexico. The solar evaporation ponds are proposed to be placed adjacent to the Intrepid West Mine facility in Section 2, T21S, R30E in Eddy County, New Mexico. Figure 2.1, HB Project General Arrangement Drawing, shows the location and layout of the project.

3.0 RESPEC Subsidence Analysis

Intrepid contracted RESPEC to perform a detailed subsidence analysis of the HB Mines area in respect to subsidence that has occurred as a result of conventional mining and the additional subsidence that may occur as a result of solution mining a portion of the HB Mines area. RESPEC produced a report with their subsidence analysis titled *Evaluation of Ground Subsidence Over the Intrepid HB Mines, Carlsbad, New Mexico, April 2011 (*RESPEC Report).

A description of the RESPEC Report subsidence analysis and results is provided below.

3.1 Subsidence Analysis

Surface subsidence can occur as a result of underground mining, either by conventional room-and-pillar mining or by solution mining. The creation of mined openings in underground potash beds seams will disturb the stress equilibrium that exists before mining. As a result of this disturbance, the salt surrounding the mine will creep toward and into the mined (or solutioned) openings, gradually closing them. This creep closure will continue until the stress equilibrium is reestablished, which will only be achieved when the mined openings are fully closed.

In addition to vertical displacements associated with the ground surface subsiding, mining-induced subsidence also causes horizontal displacements, tilt, horizontal extension and compression, and curvature of the ground surface. If the subsidence is great enough, each of these types of deformation can damage surface structures, such as pipelines, transmission lines, railroads, roads, buildings, and oil storage and processing infrastructure as well as subsurface structures such as water and oil and gas wells.

The objective of the RESPEC analysis was to predict and evaluate the subsidence and surface movement above the HB Mines, for both the existing room-and-pillar areas (conventionally mined) and the proposed solution-mined areas, and to evaluate the damage potential to existing surface structures in the vicinity of the mines. The ultimate subsidence is that which will eventually occur after complete closure of the underground mine; i.e., a condition of steady state. Although ultimate subsidence is likely to require many decades, or possibly hundreds of years, to be achieved, complete mine closure does indicate the worst-case scenario.

The HB Mines area proposed to be solution mined extends about 10 miles in the east-west direction and about 15 miles in the north-south direction and contains four distinct areas: the HB Eddy Mine, the HB South Mine, the HB North Mine, and the HB Crescent Mine, where the separation distance between these areas varies from 0.5 mile to 1.0 mile. The mean height of the conventionally mined seam is 6 feet, varying from 4.3 to 7.2 feet. The potash has been historically mined using underground room-and-pillar methods with a global extraction ratio of approximately 65 percent. Intrepid is proposing to solution mine the remaining pillars in portions of four of the mines (see Figure 1.1). This removal of potash from the pillars through solution mining, and to a lesser extent from the surrounding abutment pillar along the flooded solution interface, will result in additional surface subsidence and perturbation of the existing deformation and stress fields.

3.1.1 Technical Analysis and Modeling

Surface subsidence displacement predictions were made using the Solution Mining Research Institute (SMRI) computer program SALT_SUBSID [Nieland and Van Sambeek, 2010]. SALT_SUBSID is a three-dimensional computer program developed to simulate ground subsidence above solution-mined caverns or dry mines in salt, potash, and trona

deposits. Subsidence is estimated in SALT_SUBSID using influence functions to relate the closure of underground openings to surface displacements. The ultimate subsidence from complete closure of an underground opening is estimated by integrating the influence function over the volume of the opening. The subsidence at a specific time is determined as the ultimate subsidence multiplied by the fractional closure of the opening at the desired time. The solutions for each individual opening are superimposed to obtain an approximation for the total displacements at the ground surface.

Although vertical subsidence displacements are generally larger than the associated horizontal displacements, the horizontal displacements or strains may be the most damaging to surface piping and other structures. Tilt (the rate of change in vertical subsidence with respect to horizontal location) is another measure that is used in evaluating the effects of surface subsidence on bending. The horizontal surface strains and surface tilt are calculated from the surface displacements

3.1.2 Subsidence Model Inputs

The inputs required to make ultimate subsidence predictions with SALT_SUBSID are those related to the mine geometry. The mine geometry in SALT_SUBSID is defined by breaking the entire mine into smaller mining blocks. Each mining block is defined by a number of geometrical and mining parameters. The block's shape is specified as a thin quadrilateral element, parallel to the ground surface. The mining parameters include the date that the mining within the block occurs, the depth of the mining block, the height of the mining within the block, and the extraction ratio within the block. The extraction ratio is the ratio of the mined area within the region (or mining block) to the total area of the region (or mining block). Because only ultimate subsidence is considered in this analysis, the mining dates have no bearing on the results.

The SALT_SUBSID mining blocks developed for the HB Mines are shown in Figure 3.1. In the numerical simulation, mining blocks were used to model three specific types of mining; namely, (1) the original room-and-pillar mined panels, (2) the additional solution-mined area within the existing panels, and (3) the abutment pillar immediately adjacent to the mined panels in the solution-mined area. All of the mining blocks were assumed to be square in cross-sectional area, having a mining height of approximately 6 feet. The depth to each mining block was based on actual mine records and varies from 534 feet in the north to nearly 1,500 feet in the south. The original room-and-pillar mining blocks were assigned an extraction ratio value of 0.65, based on the given room and pillar dimensions. The solution-mined area was assigned a supplemental extraction ratio equal to the product of the percent potash grade (varies from 9 percent to 35 percent) in the pillars and the fractional volume of the pillars available (0.35). The blocks comprising the abutment pillar adjacent to the flooded area were assigned an extraction ratio equal to one-third of the percent potash grade. The model contains a total of 2,255 mining blocks: 1,638 in the initial mined area, 431 in the flooded area, and 186 in the adjacent abutment pillars. In addition to ultimate total subsidence calculations, tilt and strain calculations were made along linear (or multilinear) surface features such as oil and gas pipelines (Figure 3-2), water and brine pipelines (Figure 3-3), railroad lines (Figure 3-4), paved roads [only paved roads were considered in this analysis, gravel roads were not evaluated (Figure 3-5)], telecommunications lines (Figure 3-6), and power lines (Figure 3-7) that are present above the HB Mines. Subsidence, tilt, and strain calculations were made on two surface properties (Figure 3-8); specifically, the J. Richardson property and the Shackleford Barber oil field tank facility. Finally, tilt and strain calculations were also made along nine oil and

gas wells located within the HB Mines property area that extend through the mined ore zone horizon or are within the predicted subsidence zone of the HB Mines. Those wells include the Stovall Wood #1, Stovall Wood #2, Stovall Wood #3, Colglazer #1, Colglazer #2, Colglazer #3, State #1 and State #2, located in the Barber oil field within the HB South Mine perimeter, and the Big Eddy 11 gas well adjacent to the southeast edge of the HB Crescent Mine (Figure 3-8).

Table 3.1 lists each of the known features described above, and the owner of record, in the HB Project area.

3.1.3 Subsidence Evaluation

Besides vertical surface displacement, other forms of ground movement, such as tilt and strain (both extensional and compressional), are associated with ground subsidence. Each of these may damage surface structures (if displacement, tilt or strain exceed acceptable design limits for structures) and alter surface water drainage patterns. Figure 3-9 shows these different subsidence components that result from the closure of mined openings.

Vertical displacements of the ground surface are generally the most evident result of subsidence. For a given mined opening, the largest vertical displacement occurs over the center of the opening, as shown by the red line in Figure 3-9. The angle of draw defines the lateral extent of subsidence at the surface. As shown in Figure 3-9, it is the angle between a vertical line at the edge of the mined opening and a line extending from the edge of the mined opening to the edge of the subsidence bowl on the surface. Significant ground subsidence can lower the elevation of an area to the point where drainage patterns are affected. As a result, water may collect in areas that were previously drained.

Horizontal displacements of the ground surface result in extensional and compressional strains (expressed as a change in length per unit length). The strains are generally extensional around the perimeter of the mined opening and compressional above the openings, as shown in Figure 3-9. Horizontal strains can be transferred to surface structures and can damage the structures by stretching or compressing them. Strains of less than 1 millistrain are not expected to result in significant damage of surface structures. In the RESPEC study, the horizontal principal strains were calculated, both in tension and compression, based on the calculated surface displacements.

Tilt is the slope of the ground surface and is expressed as the change in elevation per horizontal unit length. As shown in Figure 3-9, tilt values are generally highest near the edges of mined openings and smallest near the center. Tilt and changes in tilt (curvature) can result in the angular distortion of a structure's walls (cracking) that can cause the cracking of brickwork, drywall, and plaster; distortion of door and window frames; and stair-step cracking and shifting of floors. Tilt can also cause asymmetric loading on sensitive industrial machinery and bending stresses within pipelines. Pipelines are not expected to be adversely affected by tilt for values below 2 millistrain. In the RESPEC Report analysis, the magnitude of the maximum tilt was calculated based on the surface displacement.

3.2 Subsidence Analysis Results

The RESPEC Report reported results of the analysis for three mining situations:

- subsidence from the existing conventional mine,
- subsidence from future solution mining, and
- total (combined conventional mine and solution mining) subsidence.

Four summary results are presented for each of the mining situations described above: subsidence, tilt, maximum principal (tensile) strain, and minimum principal (compressive) strain. The summary results are presented separately, for each mining situation, below.

3.2.1 Existing Mine Subsidence Results

The maximum estimated subsidence that has and will occur over the existing HB Mines as a result of the conventional underground mining occurs near the centers of each mined portion of the mine. The maximum vertical subsidence for the HB Mines of about 4.9 feet is predicted over the central portion of the HB South Mine. The subsidence is limited in spatial extent surrounding the mined zones, with predicted subsidence less than 0.5 foot within the modeled subsidence zone. The subsidence zone was determined using an angle of draw. A conservative angle of draw value of 45 degrees was used for the HB Mines, which means that for every vertical foot of depth of the mine, subsidence could occur within the same horizontal distance at the surface around the projected perimeter of the underground opening. In other words, for a mine that is 1,000 feet deep, the subsidence zone would extend 1,000 feet outside the mined periphery at the surface.

The conventional mine-induced tilts are greatest along the periphery of the mined areas. Total tilt values are highest (approximately 4.4 millistrain) along the eastern and western periphery of the HB South Mine and to a lesser extent (4 millistrain) around the HB Eddy Mine. Above the periphery of the remaining portions of the mine; i.e., HB North Mine and HB Crescent Mine, the mine-induced tilts are less than 2 millistrain. Within the central portions of the mined areas and greater than 1,000 feet outside the peripheries of all mined areas, the mine-induced tilts are negligible; i.e., less than 0.5 millistrain.

The conventional mine-induced tensile strains are of greatest magnitude along the periphery of the mined areas. Maximum mine-induced tensile strains of 2.2 millistrain are predicted at isolated locations above the northeast perimeter of the HB Eddy Mine, but for the remainder of the surface area above the mine, the mine-induced tensile strains are less than 1 millistrain.

The conventional mine-induced compressive strains are of greatest magnitude along the inside perimeter of the regions of maximum principal (tensile) strains. These compressive-strain regions do not extend across the entire mined surface, as expected, because of the size of the mined surface. That is, the conventional mine-induced subsidence is nearly uniform across most of the mined areas, minimizing conventional mining- induced compressive stresses above the central portions of the mined areas. Maximum conventional mine-induced compressive strains of -1.95 millistrain are predicted at isolated locations above the east perimeter of the HB Eddy Mine, but for the remainder of the area above the mine, the mine-induced compressive strains are less than -1 millistrain.

These results lead to the following conclusions concerning surface movement above the existing HB Mines that has occurred, or will occur, as a result of conventional underground mining. Simply stated, these conclusions are:

- A maximum subsidence of approximately 5.0 foot is possible above portions of the existing HB Mines.
- The subsidence is nearly uniform across the surface above the mined regions of the HB Mines.
- A conservative angle of draw of 45 degrees was used to calculate the subsidence zone for the HB Mines.
- Maximum differential settlement can be expected above the perimeters of the existing mined areas, producing a few areas of localized tilts on the order of 4 millistrain and horizontal strains of 2 millistrain, which could be of concern with respect to allowable movement and distortion of surface structures.
- Over the remainder of the surface above the existing conventionally mined areas, the expected tilts and horizontal strains are less than those required to produce damage to existing surface structures; i.e., less than 0.2 millistrain and 1 millistrain, respectively.
- The surface movement is limited to within 1,500 feet outside the conventionally mined periphery.

3.2.2 Solution Mining Subsidence Results

Subsidence that may occur over the HB Mines as a result of additional (solution) mining of the remaining pillars in the southern portions of the four existing mines (HB Eddy, HB South, HB North, and HB Crescent) was analyzed. Subsidence that occurs as a result of solution mining is characterized as "incremental" subsidence in this report. The purpose for that characterization is to distinguish between the modeled subsidence as a result of conventional mining and the modeled additional subsidence from solution mining (incremental subsidence). The modeling showed that the maximum incremental subsidence would result near the centers of each solution-mined portion of the mine. A maximum incremental subsidence of about 0.5 foot is predicted over the central portion of the solution-mined portion of the HB North Mine. The subsidence is limited in spatial extent surrounding the solutioned zones, with predicted subsidence less than 0.1 foot outside 1,000 feet of the solution-mined periphery.

The solution mining-induced tilts are greatest along the northern (shoreline) periphery of the solution-mined portions of the HB Eddy and HB South Mines, approximately 0.4 millistrain in magnitude. Above the remaining solution-mined portions of the mine and greater than 1,000 feet outside the peripheries of all solution-mined areas, the incremental tilts are negligible; i.e., less than 0.1 millistrain.

The solution mining-induced tensile strains are of greatest magnitude along the periphery of the solution-mined areas. Maximum mine-induced tensile strains of 0.2 millistrain are predicted in limited areas along the northern shoreline above the HB Eddy Mine. Above the remaining solution-mined portions of the mines and greater than 1,000 feet outside the

peripheries of all solution-mined areas, the incremental surface tensile strains are negligible; i.e., less than 0.1 millistrain.

The solution mining-induced horizontal compressive strains are of greatest magnitude above the shoreline of the solution-mined areas. Maximum incremental compressive strains of -0.2 millistrain are predicted in limited areas along the northern shoreline above the HB South Mine and HB Eddy Mine. Above the remaining solution-mined portions of the mine and greater than 1,000 feet outside the peripheries of all solution-mined areas, the incremental surface compressive strains are negligible; i.e., less than -0.1 millistrain.

These results lead to the following conclusions concerning incremental surface movement above the HB Mines that could occur as a result of proposed solution-mining area of the HB Mines. Simply stated, these conclusions are:

- A maximum incremental subsidence of approximately 0.5 foot is possible above solution mined portions of the HB Mines.

- Incremental differential settlement can be expected above the shorelines of the proposed solution mines, but all incremental tilts and horizontal strains are less than 10 percent of those produced by existing mining, which should not be of concern with respect to incremental movement and distortion of surface structures;.

- The incremental surface movement is limited to within 1,500 feet outside the solution-mined perimeter.

3.2.3 Total Mine (Combined Conventional and Solution Mining) Subsidence

The RESPEC report analyzed the total subsidence, tilt, maximum principal (tensile) strain, and minimum principal (compressive) strain that would occur over the HB Mines because of both existing conventional mine-induced closures and solution-induced closures. Those results were nearly identical to the results of due to conventional underground mining, indicating that the proposed solution mining will have negligible (< 10 percent) impact on the total movement across the surface above the entire HB Mines area.

3.3 Subsidence Analysis and Impacts on Surface Features and Wells

Tilt and strain calculations were made along 32 existing linear surface features above the HB Mines, including 8 oil and gas pipelines, 4 water injection and extraction brine lines, 3 railroad lines, 3 paved roads, 3 telecommunications lines, and 11 power lines (Figures 3-2 through 3-8).

The tilt and strain calculations for the linear surface facilities included were done for solution-mining induced incremental subsidence and the total predicted subsidence from the existing conventional underground mining combined with solution-mining. The incremental solution mining results indicate that over all 32 surface features, the maximum solution-mining-induced tilts, compressional strains, and extensional strains are 0.5, –0.2, and 0.16 millistrain, respectively. All of these incremental tilts and strains are significantly less than that required to adversely affect the structural integrity of these 32 surface structures; i.e., the expected incremental tilts are less than 2 millistrain and the incremental strains are significantly less than 1 millistrain. The total tilts and strains resulting from conventional underground mining combined with solution mining indicate that the allowable tilts and strains are exceeded at some isolated locations along some of the features. However, calculated exceedances of allowable tilts and strains occur as a result of the

existing conventionally mined underground workings, not as a result of the proposed solution mining. In general, only 10 percent of the total results calculated tilts and strains are attributed to the proposed solution mining. This indicates that over at least 90 percent of the anticipated surface movement has already occurred, and additionally that the proposed solution mining will not adversely affect any of the existing surface features. These conclusions can also be made for all surface features not explicitly modeled in the RESPEC Report, which include the proposed HB Project injection and extraction wells and associated brine pipelines that lie within the HB Mines subsidence zone.

Subsidence, tilt, and strain calculations were made on two surface properties, the J. Richardson property and the Shackelford Barber oil field tank facility. Both of these properties are located directly above the expected edge of the flooded area in the central portion of the HB South Mine. The total (existing conventional underground mining plus solution mining) movement (subsidence, tilts, and strains) is negligible at all areas in both of these properties. The results of the analysis show the calculated movement is much less than that required to adversely affect the structural integrity of all existing surface structures on these properties.

Incremental and total tilt and strain calculations were also made for the oil and gas wells within the subsidence zone of the HB Mines. Tilt and strain calculations were made along the vertical depth of the well, from the surface to within 200 feet of the mined opening at each well location. Incremental tilts and strains in this area are less than or equal to that found at 200 feet above the mined opening. As subsidence does not have the potential to impact wells below the mined opening, no evaluation of potential impacts to a well is necessary below the depth of the mined opening that the well penetrates or is adjacent to.

The incremental well results indicate that over all the oil and gas wells, the maximum solution-mining-induced tilts, compressional strains, and extensional strains are 0.2, –0.2, and 0.2 millistrains, respectively. The maximum total (existing conventional underground mining combined with solution mining) tilts, compressional strains, and extensional strains are 2, –1.5, and 1 millistrains, respectively. All of these incremental and total tilts and strains are less than that required to adversely affect the structural integrity of these ten wells; i.e., the expected incremental tilts are less than 2 millistrains, and the incremental strains are significantly less than 1 millistrain.

3.4 Subsidence Analysis Summary

An ultimate subsidence analysis of Intrepid's proposed solution mining of the HB Mines was conducted. The results of the subsidence analysis are conservative for two reasons. First, ultimate subsidence is the total subsidence that will eventually occur after complete closure of the underground mine and is likely to require many decades or possibly hundreds of years to be achieved. Secondly, 100 percent of the convergence volume of the mined openings is assumed to result on the surface as subsidence. In actuality, not all of the convergence volume shows up at the surface as subsidence because a portion of it is absorbed by inelastic behavior in the overlying strata.

A maximum total (existing conventional underground mining plus the proposed solution mining) subsidence of about 5.2 feet is predicted over the central portion of the HB Mines area. Predicted ultimate strains are tensile around the edges of the mining panels and compressive above the previously conventionally mined underground areas. The maximum horizontal strains (both extensional and compressional) along the surface are predicted to be approximately 2 millistrain. The largest values of total tilt predicted are about 4 millistrain and occur above the edges of the mines. In both the strain and tilt calculations, the amounts attributed to solution mining are only

approximately 10 percent of the total amounts. Thus the incremental maximum tilts and strains caused by solution mining are approximately 0.4 and 0.2 millistrain, respectively. All surface features (including oil and gas pipelines, water and brine pipelines, railroad lines, paved roads, telecommunications lines, power lines, and surface properties) are not expected to be adversely affected as a result of incremental subsidence from solution mining since the calculated tilts and strains are significantly less than required to cause structural damage. The existing oil and gas wells within the HB Mines subsidence zone are not expected to be adversely affected by the proposed solution mine.

A number of specific conclusions concerning the subsidence above the existing HB Mines follow.

Existing Mine Subsidence

- A maximum subsidence of approximately 5.0 foot is possible above portions of the existing HB Mines.
- The subsidence is nearly uniform across the surface above the mined regions of the HB Mines.
- A conservative angle of draw of 45 degrees was used to calculate the subsidence zone for the HB Mines.
- Maximum differential settlement can be expected above the perimeters of the existing conventionally mined areas, producing a few areas of localized tilts on the order of 4 millistrain and horizontal strains of 2 millistrain, which could be of concern with respect to allowable movement and distortion of surface structures.
- Over the remainder of the surface above the existing mine, the expected tilts and horizontal strains are less than those required to produce damage to existing surface structures; i.e., less than 0.2 millistrain and 1 millistrain, respectively.
- The surface movement is limited to within 1,500 feet outside the mined periphery.

Solution-Mining Subsidence

- A maximum incremental subsidence of approximately 0.5 foot is possible above solution-mined portions of the HB Mines.
- Incremental differential settlement can be expected above the shorelines of the proposed solution mine extent, but all incremental tilts and horizontal strains are less than 10 percent of those produced by existing mining, which are not predicted to be of concern with respect to incremental movement and distortion of surface structures.
- The incremental surface movement is limited to within 1,500 feet outside the solution-mined perimeter.

Total Subsidence

- All total surface movements (subsidence, tilts, and horizontal strains) are nearly identical to the existing mining (conventionally mined only) results.

- The proposed solution mining will have negligible (< 10 percent) impact on the total movement across the surface above the entire HB Mines area.

Other Surface Features

- Tilt and strain calculations for surface features were done for both solution-mining induced subsidence and the total predicted subsidence from the existing conventional underground mining combined with solution-mining. Calculations were made along 32 linear surface features above the mine, including 8 oil and gas pipelines, 4 water and brine pipelines, 3 railroad lines, 3 paved roads, 3 telecommunications lines, and 11 power lines.

- Incremental and total subsidence, tilt, and strain calculations were made on two surface properties, the J. Richardson property and the Shackeleford Barber oil field tank facility property.

- All of the incremental solution-mining-induced movements (tilts and strains) along these linear and areal surface features are significantly less than that required to change affect the structural integrity of existing surface features and structures.

Wells

- Incremental and total tilt and strain calculations were made along for oil and gas wells located within the HB Mines subsidence zone.

- All of the incremental solution-mining-induced movements (tilts and strains) from the surface to the mine openings they penetrate, or adjacent to, are significantly less than that required to affect the structural integrity of the existing wells.

- The total (existing conventional underground mining combined with the proposed solution mining) induced movements (tilts and strains) from the surface to the mine openings they penetrate, or adjacent to, are significantly less than that required to affect the structural integrity of the existing wells.

4.0 Subsidence Monitoring Plan

Solution mining is not predicted to result in subsidence that will affect existing linear surface features (including 8 oil and gas pipelines, 4 water injection and extraction brine lines, 3 railroad lines, 3 paved roads, 3 telecommunications lines, and 11 power lines), surface properties (the J. Richardson property and the Shackelford Barber oil field tank facility) and oil and gas wells (the Stovall Wood #1, Stovall Wood #2, Stovall Wood #3, Colglazer #1, Colglazer #2, Colglazer #3, State #1, and State #2, located in the Barber oil field within the HB South Mine perimeter, and the Big Eddy 11 gas well adjacent to the southeast edge of the HB Crescent Mine) that currently lie within the HB Mines subsidence zone.

Additionally, the analysis performed by RESPEC can be applied to Intrepid's proposed HB Project injection and extraction wells and injectate and extracted brine pipelines and that lie within the HB Mines subsidence zone. Therefore, solution mining is not predicted to result in subsidence that will impact these proposed Intrepid wells and pipelines to be constructed as part of the HB Project.

As a result, a plan defining subsidence mitigation measures for each specific feature is not warranted at this time. Rather, a subsidence monument survey approach will be undertaken to regularly measure actual ground movement and evaluate the results of the subsidence analysis. In order to verify that movement from solution mining induced subsidence is within the limits of tilts and strains necessary to potentially impact the above described features, Intrepid proposes to perform subsidence monitoring on a quarterly basis once solution mining begins.

The subsidence monitoring network within the HB Mines subsidence zone is composed of five linear transects of subsidence monitoring monuments as described below and shown on Figure 4-1.

Transect	Flooded Working
HB-SM1	HB Eddy
HB-SM2	HB South
HB-SM3	HB North
HB-SM4	HB North
HB-SM5	HB Crescent

The transects have been positioned to start outside the subsidence zone of the existing conventionally mined workings, proceed through the proposed flooded zone, proceed through conventionally mined workings not proposed for flooding, and extend out past the subsidence zone of the existing conventionally mined workings. This geometry is anticipated to document surface movement associated with subsidence both within and immediately outside the proposed flood zone

The subsidence monitoring network was installed and surveyed in July 2009. Subsidence monuments were established along each transect and Table 4-1 lists the number of subsidence monuments and associated coordinates for each transect. The subsidence monument design and installation plan was submitted to BLM on May 29, 2009 and approved (see Appendix A). A second survey of the subsidence monitoring network was completed in April 2011 as a baseline measurement and for verification of the initial installation survey.

4.1 Subsidence Monitoring Network Surveying

The subsidence monitoring network, consisting of the five linear transects described above, have been surveyed using a GPS survey instrument with accuracy of +/- 0.01 feet relative to elevation and all subsequent surveys will exhibit the same degree of accuracy. Baseline surveys (July 2009 and April 2011) have been completed and operational survey measurements would begin during the first full quarter after flooding of the HB Mines commences and quarterly thereafter. Based on results of the quarterly monitoring, the survey schedule may be adjusted. Any proposed changes to the quarterly monitoring schedule would be submitted to the New Mexico Environment Department (NMED) and US Bureau of Land Management, Carlsbad Field Office (BLM CFO) for review and approval prior to changing the monitoring schedule.

4.2 Subsidence Monitoring Results Reporting

Intrepid shall report the results of its quarterly subsidence monitoring survey as required by the NMED Discharge Permit, DP – 1681, for the HB Project, and would incorporate additional requirements that may be imposed by the BLM CFO. The specific provisions for subsidence monitoring reporting in DP – 1861 include providing a table of quarterly elevation measurements of subsidence monitoring stations that provides the history of elevation change relative to the baseline elevations.

Intrepid will evaluate the results of the quarterly subsidence monitoring surveys to determine if movement within the HB Mines subsidence zone is exceeding RESPEC's modeled tilts and strains associated with solution mining (incremental subsidence), and if so, where those measured tilts and strains may impact an existing feature, infrastructure, or well. If incremental movement is such that impact could occur, Intrepid will perform the following steps:

- Verbally notify the BLM and NMED within three days of determining that the survey data indicates incremental movement of a magnitude that could impact an existing feature, infrastructure, or well.

- Re-survey the subsidence monuments in the area of potential impact within 10 days, if necessary, to verify the accuracy of the quarterly survey results.

- Verbally notify the BLM and NMED within three days of the re-survey of the results. If the re-survey indicates incremental movement is within expected ranges, no further action is required and Intrepid will continue with standard quarterly subsidence monitoring.

- If incremental movement is such that impacts may occur to an existing feature, infrastructure, or well, a written narrative will be prepared and included in the quarterly report. The narrative will describe the potential impairment to the structural integrity, performance and safe operation of features, infrastructure, or wells, including recommended corrective actions if required.

Intrepid will submit quarterly subsidence monitoring results, as well as other reporting requirements contained in DP – 1681, to the NMED and BLM CFO by the last day of January, April, July, and October of each year.

4.3 Subsidence Mitigation Plan for Impacts from Solution Mining

As described in Section 4.0, solution mining is not predicted to result in subsidence that will affect existing linear surface features, surface properties, and oil and gas wells or that currently lie within the HB Mines subsidence zone. Additionally solution mining is not predicted to result in subsidence that will impact proposed Intrepid injection and extraction wells and associated pipelines to be constructed as part of the HB Project.

It is important to note that portions, or all, of the existing, described features, infrastructure, and wells described in this subsidence monitoring and mitigation plan lie within the existing subsidence zone from conventional mining of the HB Mines and many of these were installed after conventional mining had commenced. Intrepid is not aware that any of the described features, infrastructure, and wells contained in this plan have been impacted by subsidence due to conventional mining. Intrepid will evaluate the impacts due to the modeled contribution of solution mining as follows:

- Does the subsidence contribution as a result of solution mining exceed expected, modeled (incremental) subsidence rates (as estimated by the RESPEC Report), and
- If so, are the corresponding horizontal and tilt stain limits for linear surface features, surface properties, and oil and gas wells exceeded?

As described in Section 4.2, each quarterly report will contain an analysis regarding any indication of a potential impairment to the structural integrity, performance and safe operation of features, infrastructure, or wells due to solution mining. If conditions are documented, as described above, a specific subsidence mitigation plan would be developed. Examples of subsidence mitigation measures may include:

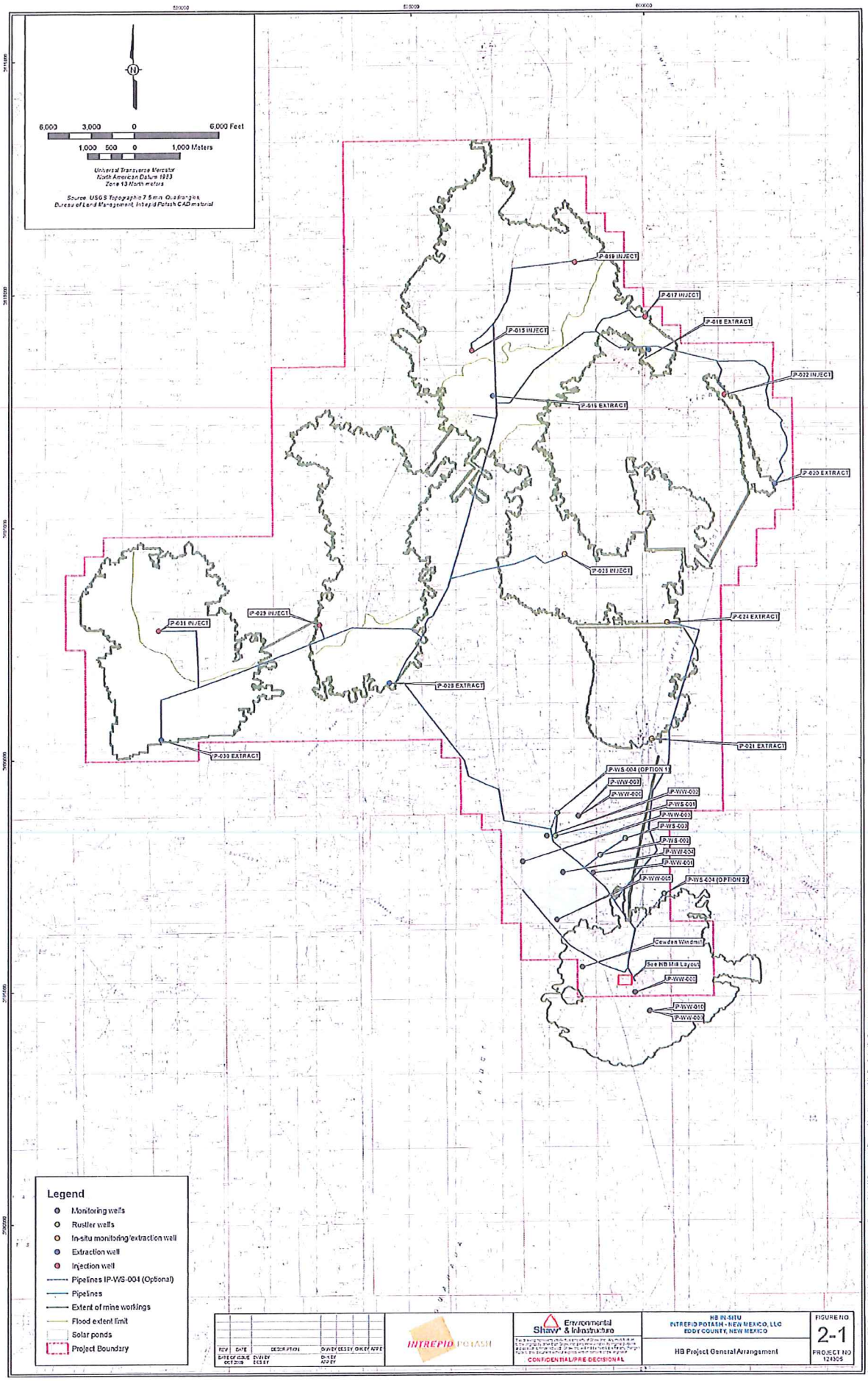
- Collection of supplemental monument coordinate measurements for authentication
- Notification of, and consultation with, the potentially affected owner of the feature, infrastructure or well and consultation.
- Installation of additional subsidence monitoring monuments adjacent to the potentially affected area, or survey of a specific benchmark (such as a core hole or corner of a fixed well pad or structure) to monitor specific areas.
- Increased survey frequency of the affected structure.
- A rock mechanic analysis of the impacted site.
- Analysis of structural integrity of the impacted feature.
- Corrective measures such as engineering / construction alterations of the feature to avoid impacts.
- Re-location of the feature.

The specific subsidence mitigation plan would be reviewed with the feature owner / operator and submitted to NMED and BLM CFO for review and approval.

5.0 References

RESPEC Report. *Evaluation of Ground Subsidence Over the Intrepid HB Mines, Carlsbad, New Mexico, April 2011*, RESPEC, Loken and Van Sambeek.

FIGURES


6,000 3,000 0 6,000 Feet
1,000 500 0 1,000 Meters
Universal Transverse Mercator
North American Datum 1983
Zone 13 North meters
Source: USGS Topographic 7.5 min. Quadrangles
Bureau of Land Management, Intrepid Potash CAD material
P-019 INJECT
P-017 INJECT
P-018 EXTRACT
P-015 INJECT
P-016 EXTRACT
P-022 INJECT
P-020 EXTRACT
P-023 INJECT
P-031 INJECT
P-029 INJECT
P-024 EXTRACT
P-028 EXTRACT
P-030 EXTRACT
P-021 EXTRACT
P-WS-004 (OPTION 1)
P-WW-007
P-WW-006
P-WW-005
P-WS-001
P-WW-004
P-WS-003
P-WS-002
P-WW-003
P-WW-002
P-WW-001
P-WS-004 (OPTION 2)
Cowden Windmill
See HB Mill Layout
P-WW-008
P-WW-010
P-WW-009
Legend
Monitoring wells
Rustler wells
In-situ monitoring/extraction well
Extraction well
Injection well
Pipelines IP-WS-004 (Optional)
Pipelines
Extent of mine workings
Flood extent limit
Solar ponds
Project Boundary
REV DATE DESCRIPTION DRAWN BY CHECKED BY APPR BY
DATE OF ISSUE OCT 2019
INTREPID POTASH
Environmental Shaw & Infrastructure
CONFIDENTIAL/PRE-DECISIONAL
HB IN-SITU
INTREPID POTASH - NEW MEXICO, LLC
EDDY COUNTY, NEW MEXICO
HB Project General Arrangement
FIGURE NO
2-1
PROJECT NO
124305

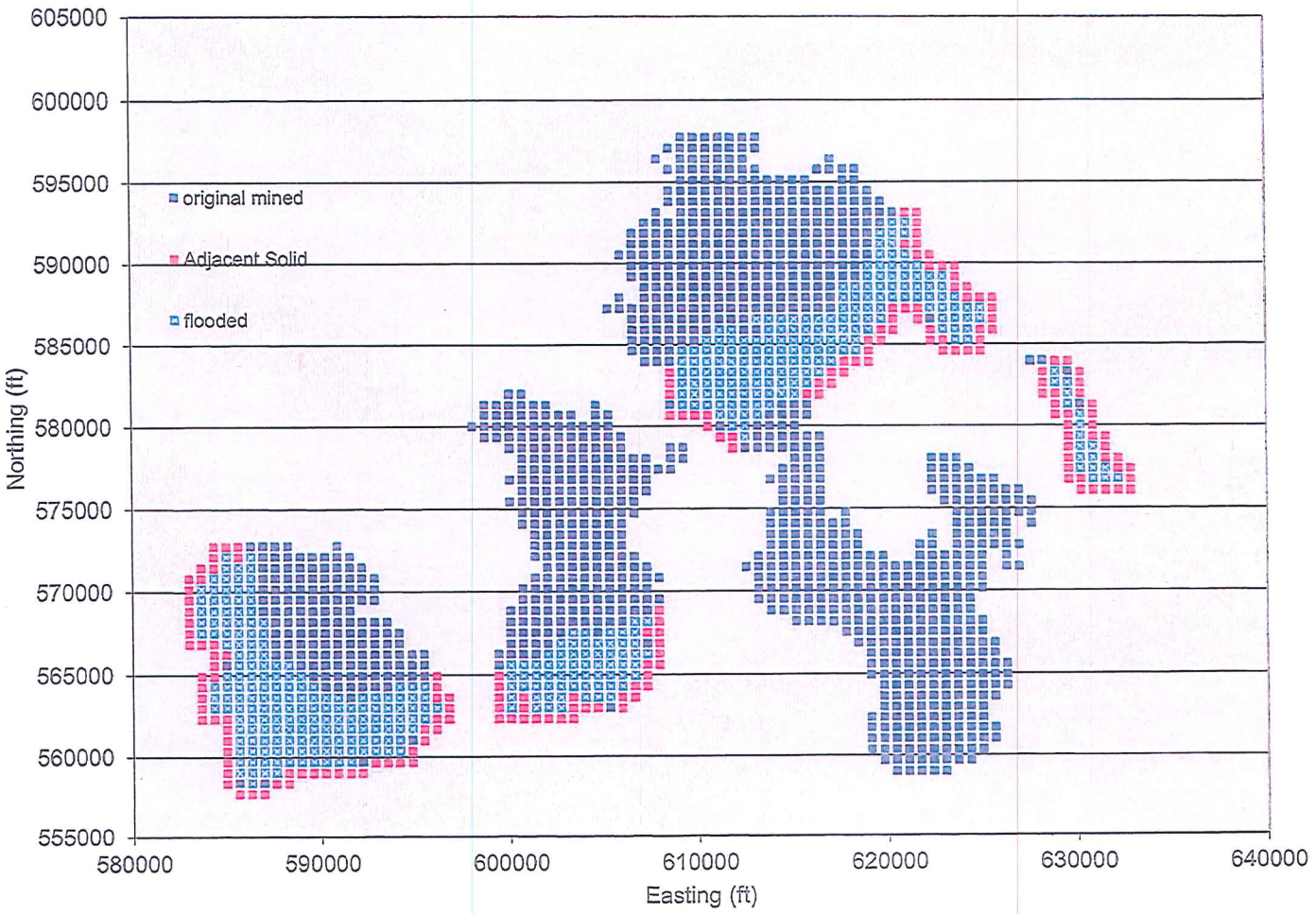


Figure 3-1. Mining Blocks Used to Define Geometry of Existing and Proposed Solution Mining of the HB Potash Mines.

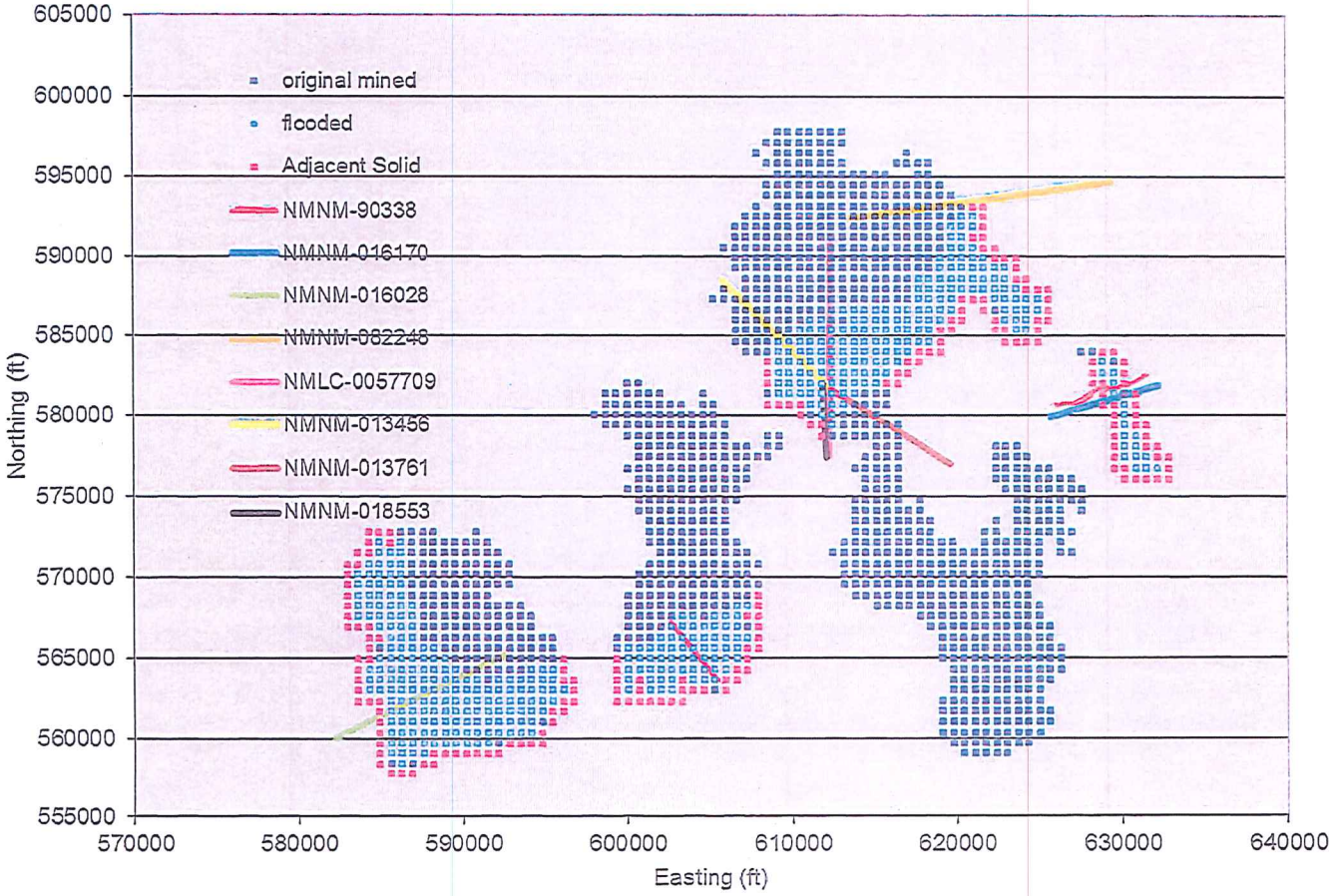


Figure 3-2. Oil and Gas Pipelines Above the HB Potash Mines.

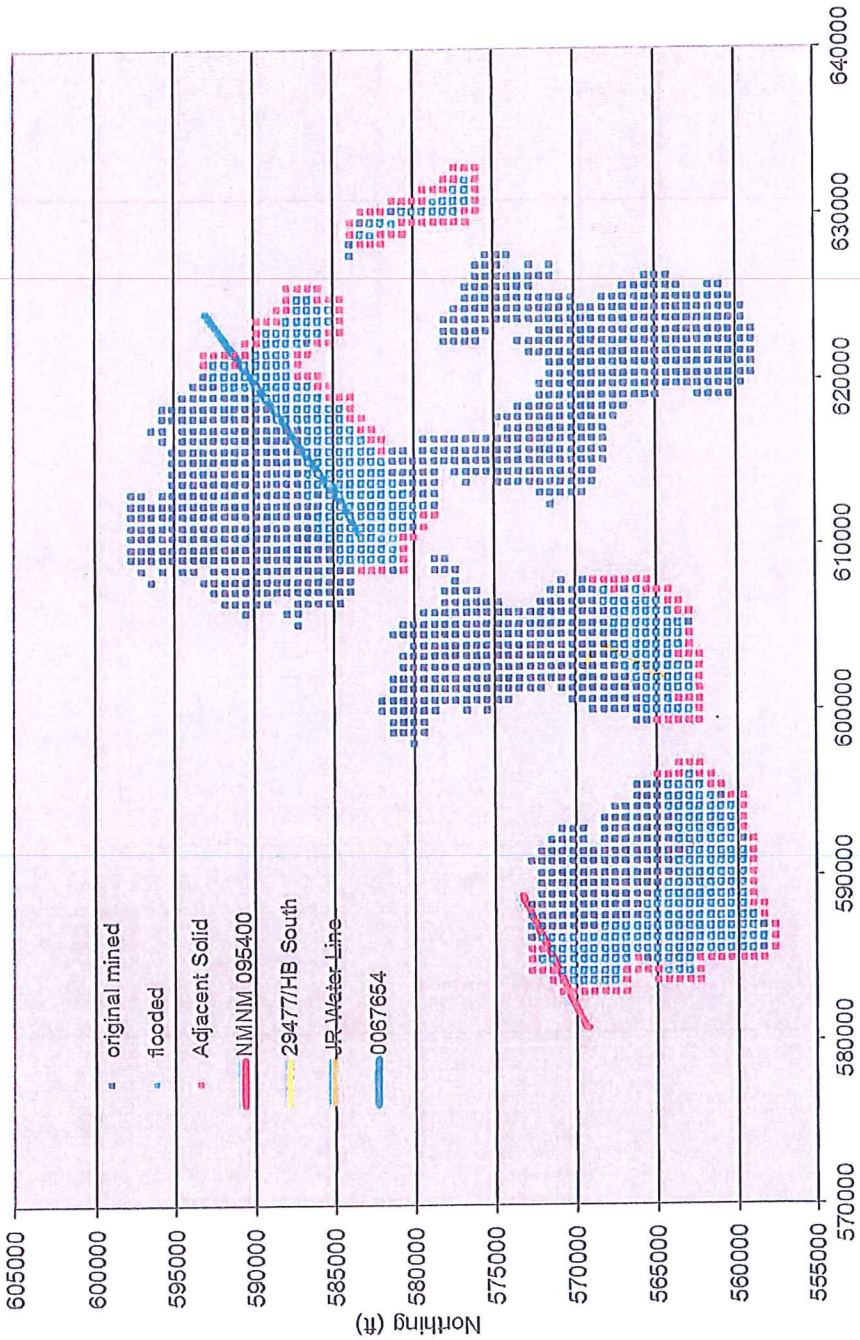


Figure 3-3. Water and Brine Pipelines Above the HB Potash Mines.

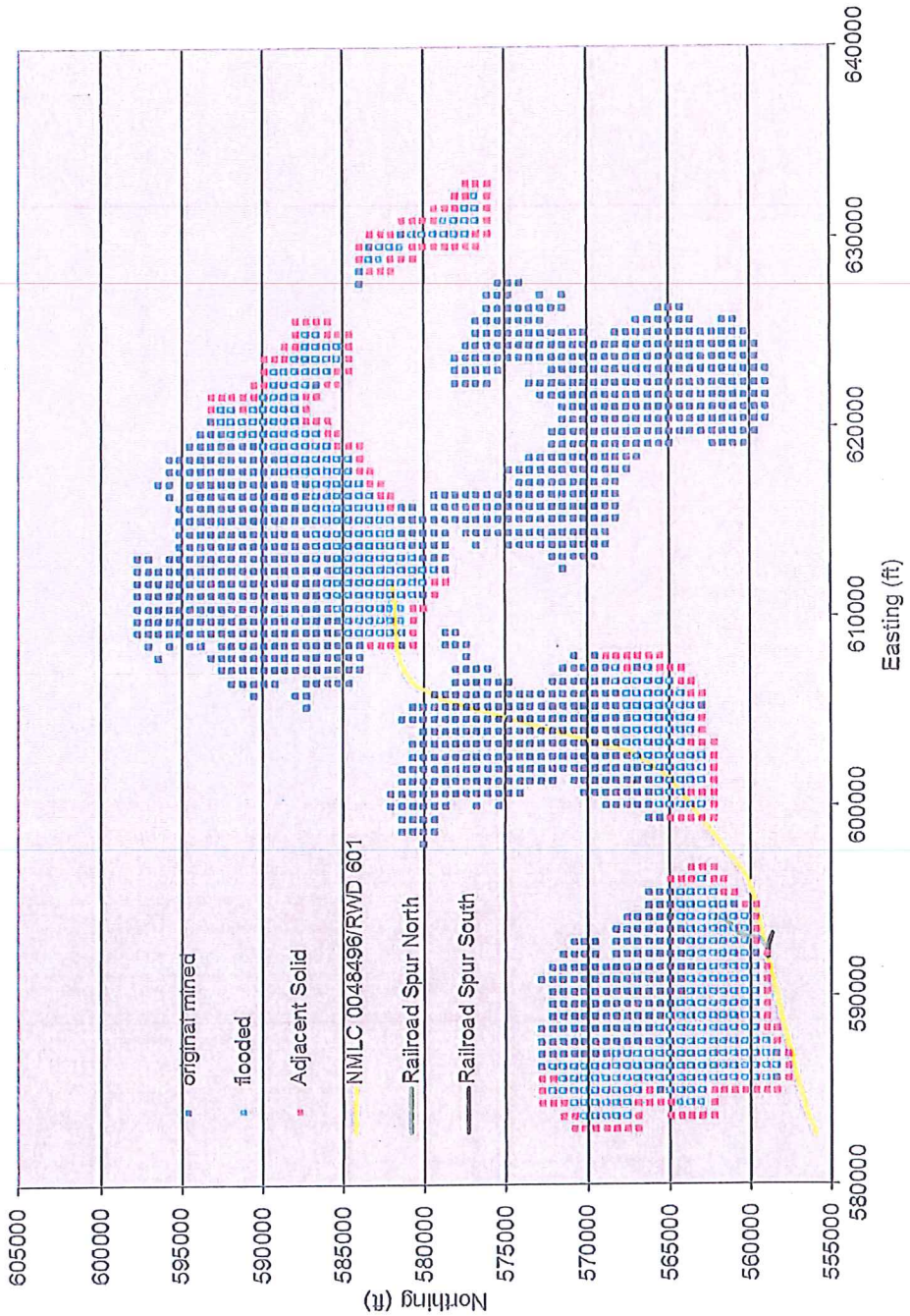


Figure 3-4. Railroad Lines Above the HB Potash Mines.

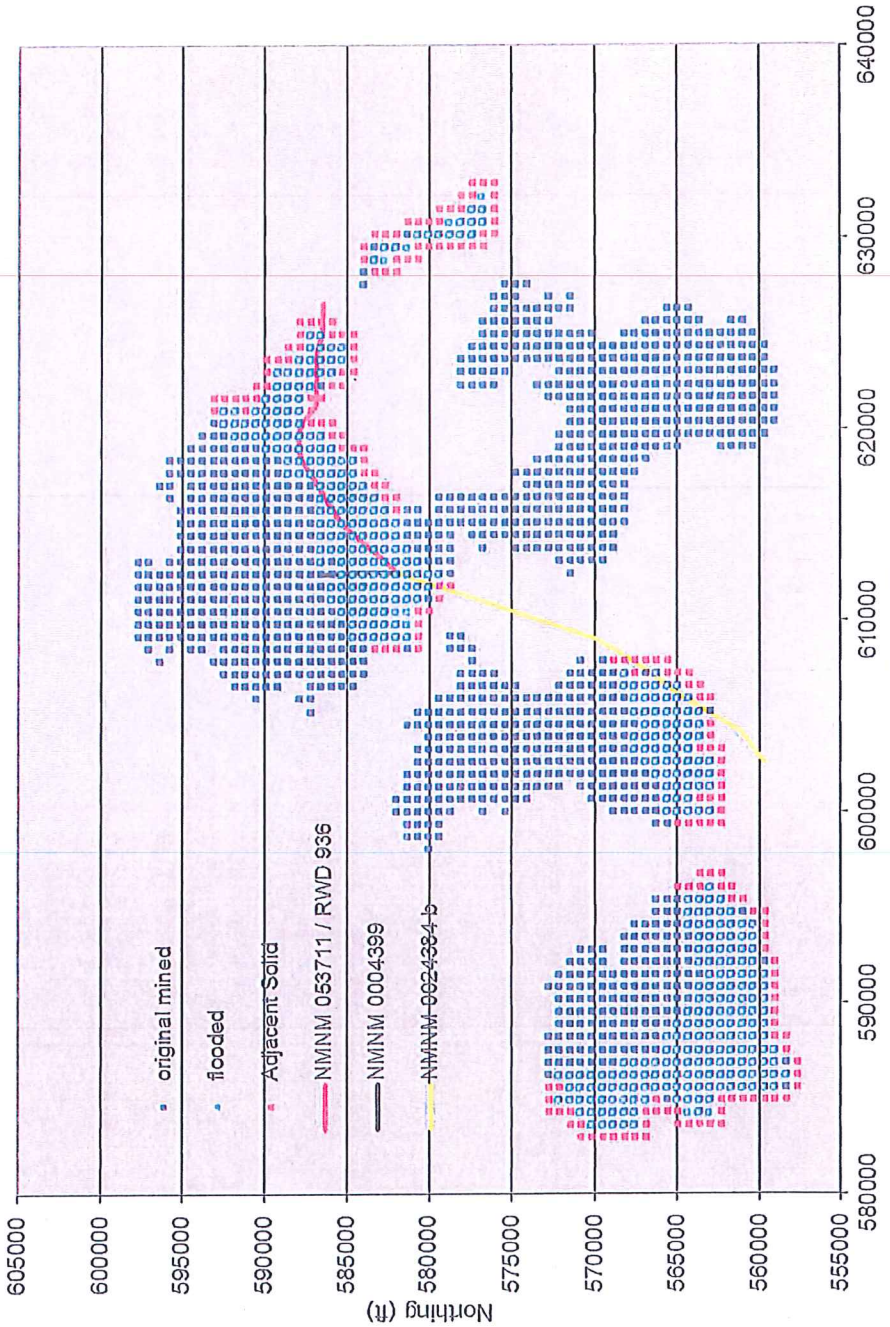


Figure 3-5. Roads Above the HB Potash Mines.

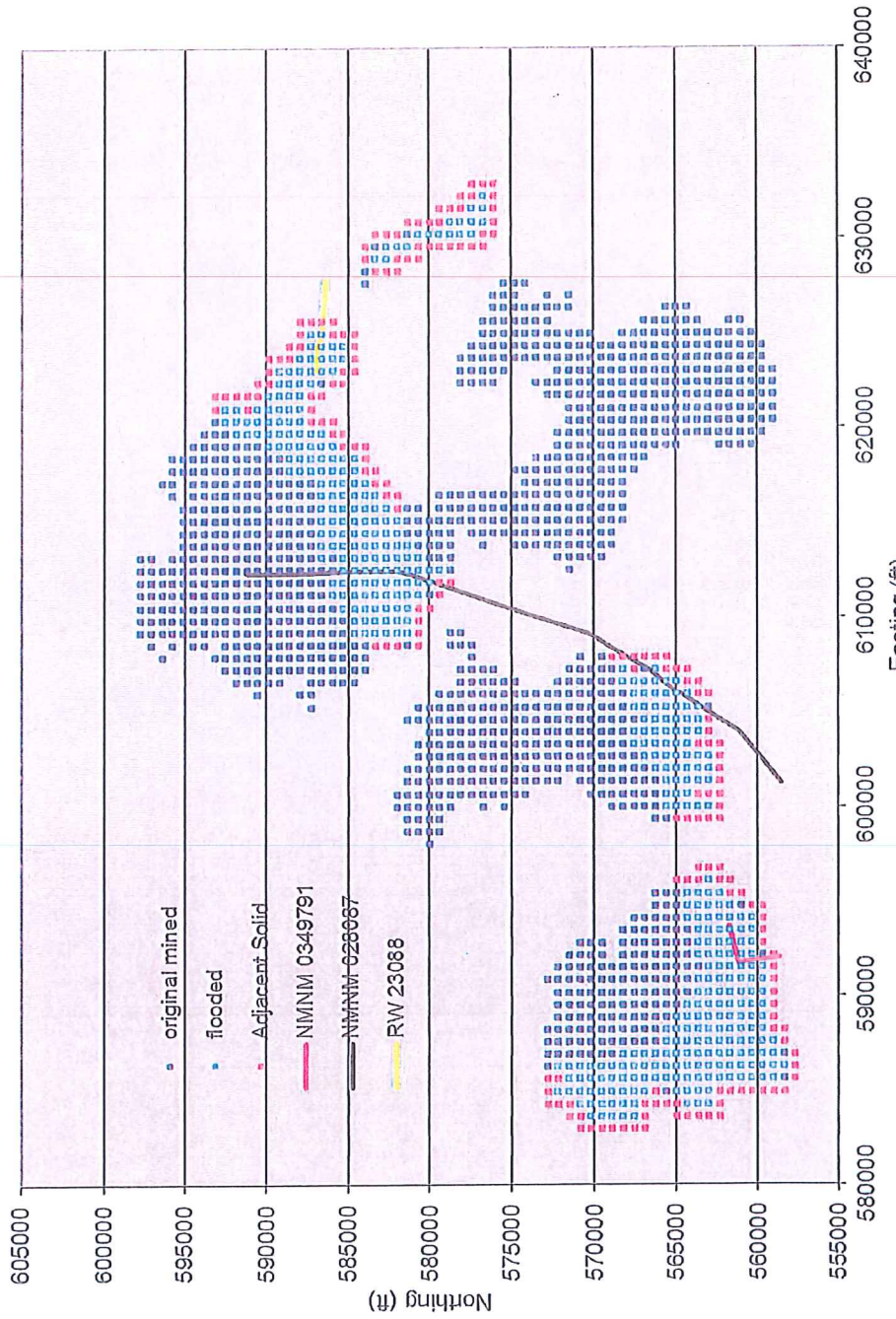


Figure 3-6. Telecommunications Lines Above the HB Potash Mines.

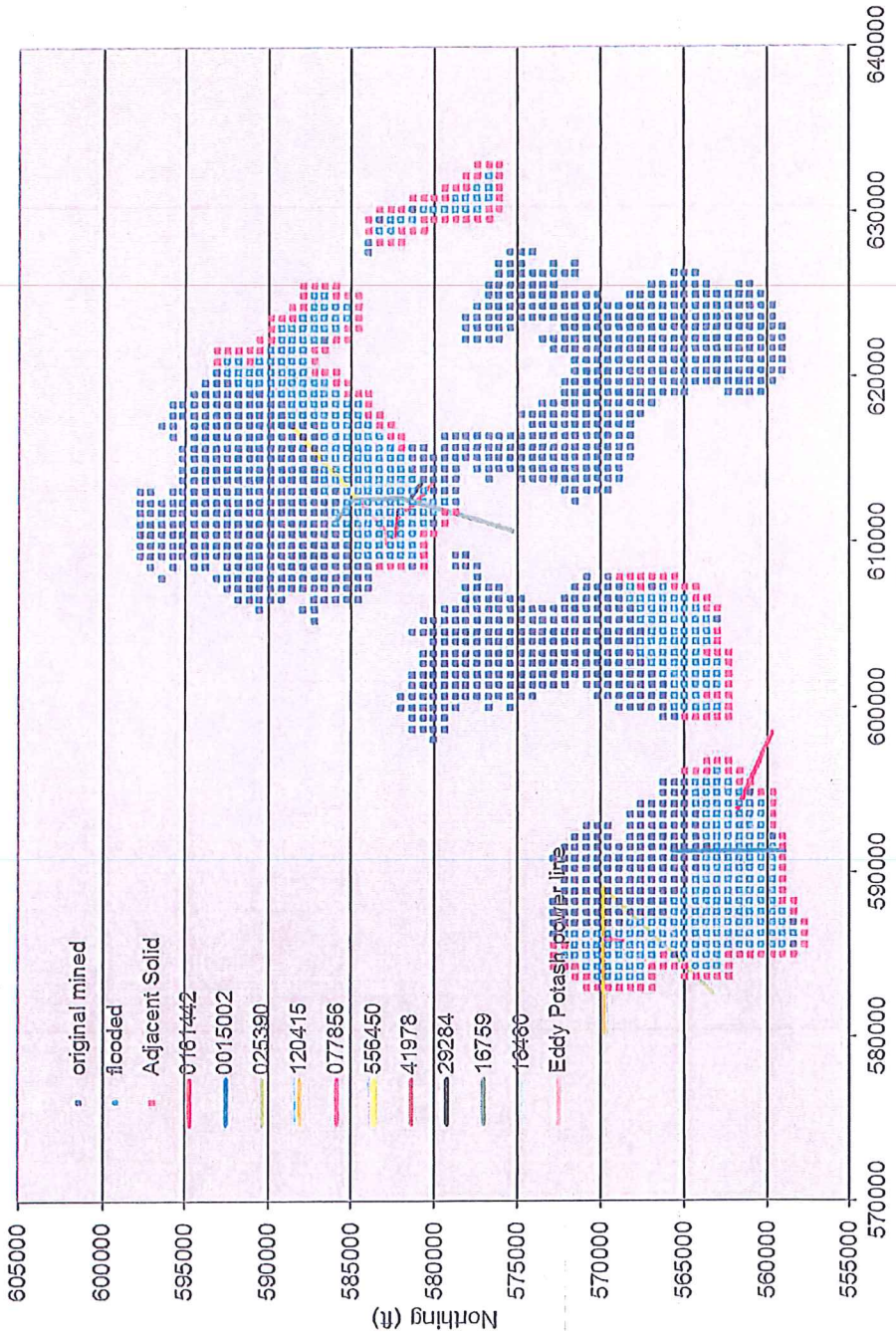


Figure 3-7. Power Lines Above the HB Potash Mines.

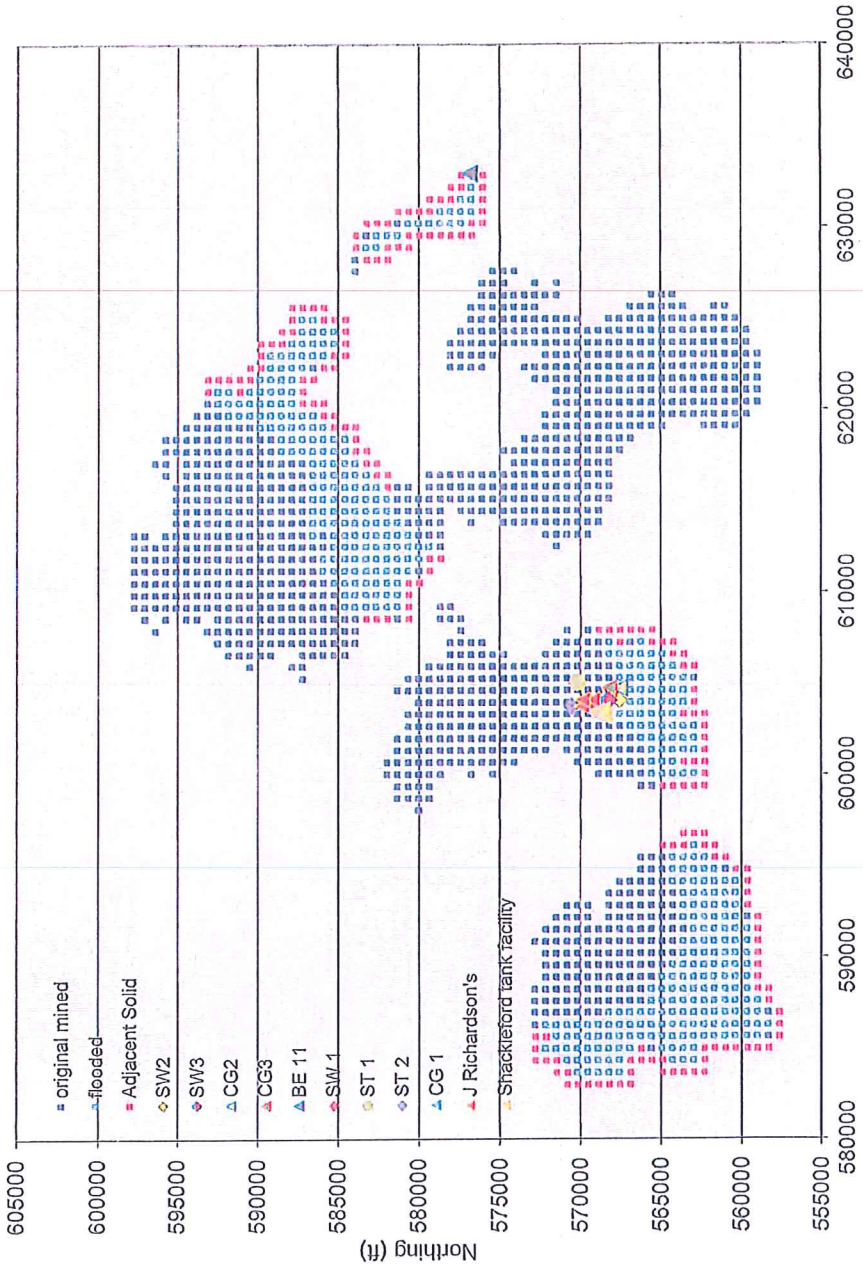


Figure 3-8. Surface Properties Above the HB Potash Mines.

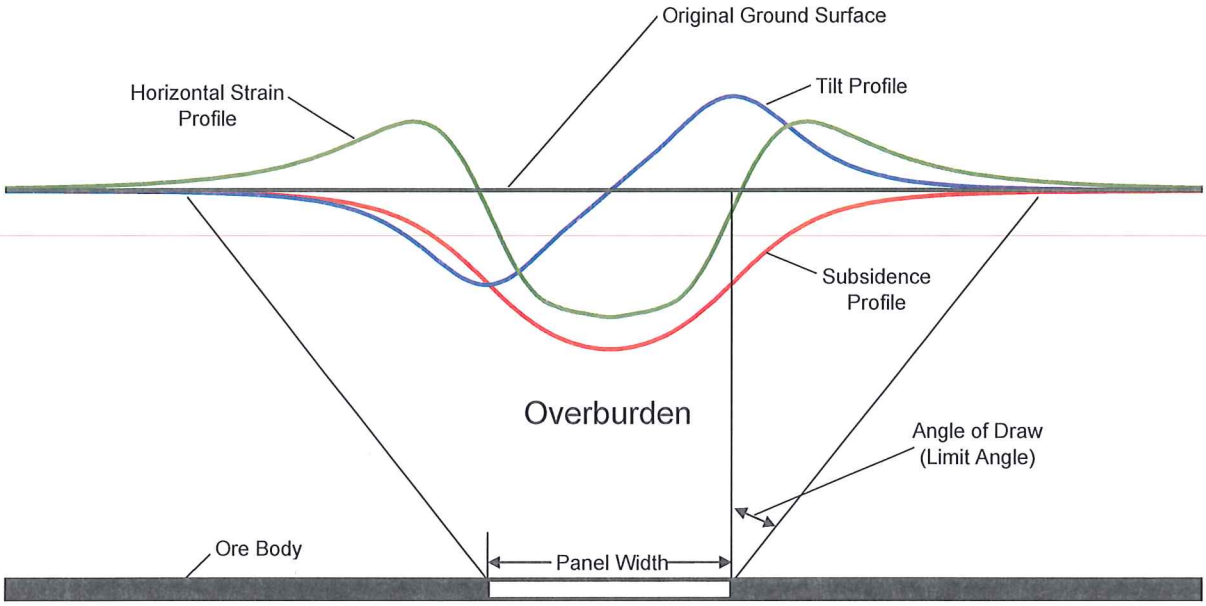
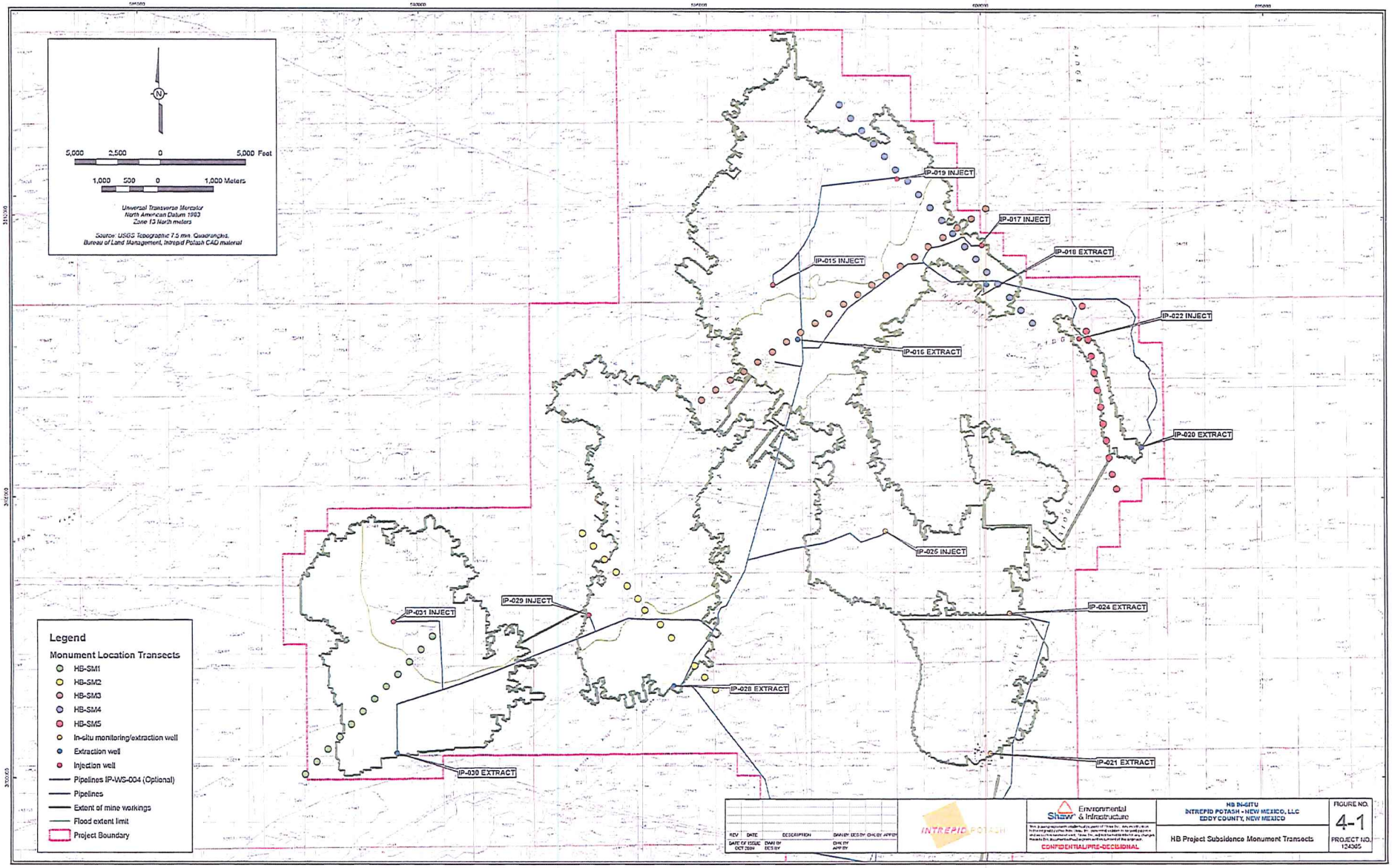


Figure 3-9. Components of Ground Movement.


5,000 2,500 0 5,000 Feet
1,000 500 0 1,000 Meters
Universal Transverse Mercator
North American Datum 1983
Zone 13 North meters
Source: USGS Topographic 7.5 min. Quadranghs.
Bureau of Land Management, Intrepid Potash CAD material
IP-019 INJECT
IP-017 INJECT
IP-018 EXTRACT
IP-015 INJECT
IP-022 INJECT
IP-016 EXTRACT
IP-020 EXTRACT
IP-025 INJECT
IP-029 INJECT
IP-031 INJECT
IP-024 EXTRACT
IP-028 EXTRACT
IP-030 EXTRACT
IP-021 EXTRACT
Legend
Monument Location Transects
HB-SM1
HB-SM2
HB-SM3
HB-SM4
HB-SM5
In-situ monitoring/extraction well
Extraction well
Injection well
Pipelines IP-WS-004 (Optional)
Pipelines
Extent of mine workings
Flood extent limit
Project Boundary
REV DATE DESCRIPTION DRAWN DES BY CHK BY APP BY
DATE OF ISSUE OCT 2009 DWN BY DES BY CHK BY APP BY
INTREPID POTASH
Environmental Shaw & Infrastructure
CONFIDENTIAL/PRE-DECISIONAL
HB IN-SITU
INTREPID POTASH - NEW MEXICO, LLC
EDDY COUNTY, NEW MEXICO
HB Project Subsidence Monument Transects
FIGURE NO. 4-1
PROJECT NO. 134005

TABLES

Table 3-1
Summary of ROWs and Facilities
Within the HB Mines Subsidence Zone

Oil and Gas Pipelines Above the HB Mines (Figure 3-2)					
Lease / Reference Number	**Owner / Operator**	**Description**	**Status**	**Construction**	**Location**
NMNM-090338	Yates Petroleum Corp	Crude Oil ?	In Service	Buried ?	HB Crescent
NMNM-016170	Duke Energy Field Services (DCP)	High Pressure Natural Gas Line	In Service	12" Buried Steel	HB Crescent
NMNM-016028	Duke Energy Field Services (DCP)	High Pressure Natural Gas Line	In Service	8" Buried Steel	HB Eddy
NMNM-082248	Duke Energy Field Services (DCP)	High Pressure Natural Gas Line	In Service	8" Buried Steel	HB North
NMLC-0057709	PNM (NMG)	High Pressure Natural Gas Line	In Service	w/6" & 2" Spur	HB North
NMNM-013456	Duke Energy Field Services (DCP)	High Pressure Natural Gas Line	In Service	4 - 6" Buried Steel	HB North
NMNM-013761	Duke Energy Field Services (DCP)	High Pressure Natural Gas Line	In Service	4 - 6" Burried Steel	HB North
NMNM-019553	PNM (NMG)	High Pressure Natural Gas Line	In Service	4-6" Buried Steel	HB North
Water and Brine Pipelines Above the HB Mines (Figure 3-3)					
Lease / Reference Number	**Owner / Operator**	**Description**	**Status**	**Construction**	**Location**
NMNM- 095400	Yates Petroleum Corp	Salt Water Disposal	In Service	3" Buried Poly	HB Eddy
RW - 29477	Shackelford Oil Co.	Salt Water Disposal	In Service	3 " Poly	HB South
JR Water Line	Jim Richardson	Cattle Water Line	In Service	3" Poly	HB South
NMLC-0067654	Eddy Potash, Inc.	Water Line	In Service?	Steel Pipe?	HB North
Railrod Lines Above the HB Mines (Figure 3-4)					
Lease / Reference Number	**Owner / Operator**	**Description**	**Status**	**Construction**	**Location**
NMLC 0048496/RWD 601	AT & SF Railway Co. (BNSF)	Railroad Track	In Service	Railroad Track	North
Paved Roads Above the HB Mines (Figure 3-5)					
Lease / Reference Number	**Owner / Operator**	**Description**	**Status**	**Construction**	**Location**
NMNM 053711/RWD 936	NM State Highway Dept	State HWY 31	In Service	Paved Road	HB North
NMNM 0004399	NM State Highway Dept	RD-State HWY 360	In Service	Paved Road	HB North
NMNM 0024384	NM State Highway Dept	HWY 31	In Service	Paved Road	HB North & South
Telecommunications Lines Above the HB Mines (Figure 3-6)					
Lease / Reference Number	**Owner / Operator**	**Description**	**Status**	**Construction**	**Location**
NMNM 0349791	Valor Telecom of NM, LLC[4 6]	Telephone	Abandon		HB Eddy
NMNM 028087	Valor Telecom of NM, LLC[4 6]	Fiber Optic Cable	In Service	w/ 24 FO (BFO-24)	HB South & North
RW 23088	Valor Telecom of NM, LLC[4 6]	Communication Pole Line	Unknown		HB South & North
Power Lines Above the HB Mines (Figure 3-7)					
Lease / Reference Number	**Owner / Operator**	**Description**	**Status**	**Construction**	**Location**
NMNM 0161442	Southwestern Public Service	Overhead Power Line	In Service	69 KV (Voltage)	HB Eddy
NMNM 0015002	Southwestern Public Service	Overhead Power Line	In Service	7.2 & 12.47 KV	HB Eddy
NMNM 025390	Southwestern Public Service	Overhead Power Line	In Service	115 KV	HB Eddy & Crescent
NMNM 120415	SAPS	Overhead Power Line	In Service	Power line	HB Eddy
NMNM 077856	Southwestern Public Service	Overhead Power Line	In Service	Line 4 wire	HB Eddy
NMNM 0556456	Potash Co of America	Overhead Power Line	In Service?	12.47 KV Elec. Dist. Line	HB North
NMNM 041978	Eddy Potash	Overhead Power Line	In Service?	12.47 KV Elec. Dist. Line	HB North
NMNM 029284	Southwestern Public Service	Overhead Power Line	In Service	7.2 KV	HB North
NMNM 0016759	Southwestern Public Service	Overhead Power Line	In Service	To Potash Co of America	HB North
RW 16480	Southwestern Public Service	Overhead Power Line	In Service	Line	HB South
Surface Properties Above the HB Mines (Figure 3-8)					
Lease / Reference Number	**Owner / Operator**	**Description**	**Status**	**Construction**	**Location**
SW2 (Stovall Wood 2)	Shackelford Oil Co.	Oil Well	In Service		HB South
SW3 (Stovall Wood 3)	Shackelford Oil Co.	Oil Well	In Service		HB South
CG2 (Colglazer 2)	Shackelford Oil Co.	Oil Well	P&A		HB South
CG3 (Colglazer 3)	Shackelford Oil Co.	Oil Well	In Service		HB South
SW 1 (Stovall Wood 1)	Shackelford Oil Co.	Oil Well	In Service		HB South
ST 1 (State 1)	Shackelford Oil Co.	Oil Well	In Service		HB South
ST 2 (State 2)	Shackelford Oil Co.	Oil Well	In Service		HB South
CG 1 (Colglazer 1)	Shackelford Oil Co.	Oil Well	P&A		HB South
BE 11 (Big Eddy 11)	Chesapeake	Gas Well	In Service		HB Crescent
J. Richardson's	Jim Richardson	Buildings	In Service		HB South
Schackelford Tank Facility	Shackelford Oil Co.	Tank Battery	In Service		HB South

Table 4-1
HB Project Subsidence Monitoring Network
Monuments Locations and Elevations by Transect

Transect Number	Location	Monument ID	7-20-2009 Coordinates		
			Northing	Easting	Elevation
HB-SM1	HB Eddy	S1-01	566285.1	632026.2	3298.454
		S1-02	565545.1	631354.3	3304.545
		S1-03	564826.8	630668.2	3302.677
		S1-04	564096.5	629985.1	3301.413
		S1-05	563364.0	629300.8	3300.067
		S1-06	562623.6	628614.7	3298.746
		S1-07	561894.4	627919.9	3291.944
		S1-08	561163.9	627247.6	3291.257
		S1-09	560423.4	626567.8	3288.808
		S1-10	559699.9	625883.0	3283.865
		S1-11	558976.2	625217.4	3278.692
		S1-12	558256.7	624534.5	3277.829
HB-SM2	HB South	S2-01	572268.0	640861.2	3291.209
		S2-02	571507.8	641495.0	3267.341
		S2-03	570727.3	642133.6	3271.86
		S2-04	569968.4	642791.9	3272.827
		S2-05	569178.6	643418.6	3247.978
		S2-06	568424.9	644056.7	3223.052
		S2-07	567734.0	644455.5	3207.983
		S2-08	566879.2	645349.5	3220.261
		S2-09	566111.4	645972.6	3249.823
		S2-10	564488.7	647318.0	3386.518
		S2-11	563808.2	647889.6	3397.943
		S2-12	563038.0	648527.9	3405.333
HB-SM3	HB North	S3-01	579984.1	647878.7	3209.773
		S3-02	580567.3	648720.3	3240.47
		S3-03	581129.7	649581.1	3235.396
		S3-04	581629.9	650363.7	3229.084
		S3-05	582177.9	651196.7	3241.576
		S3-06	582757.2	652041.9	3235.301
		S3-07	583337.4	652870.7	3199.527
		S3-08	583879.6	653707.3	3205.747
		S3-09	584410.3	654532.9	3212.232
		S3-10	584981.0	655367.4	3203.511
		S3-11	585531.9	656207.9	3204.518
		S3-12	586085.6	657048.8	3191.43
		S3-13	586644.4	657868.9	3214.57
		S3-14	587203.8	658714.0	3242.228
		S3-15	587754.4	659550.7	3239.527
		S3-16	588288.2	660377.4	3262.338
		S3-17	588889.1	661169.6	3258.225
		S3-18	589409.2	662039.4	3256.813
		S3-19	589971.5	662878.8	3267.834
		S3-20	590492.1	663704.6	3272.241
		S3-21	591071.5	664543.3	3289.967
HB-SM4	HB North	S4-01	597201.2	656077.1	3312.669
		S4-02	596428.6	656712.3	3260.559
		S4-03	595683.7	657368.6	3238.341
		S4-04	594928.2	658036.8	3236.782
		S4-05	594178.4	658667.8	3222.718
		S4-06	593396.3	659297.8	3212.469
		S4-07	592711.6	660007.0	3209.596
		S4-08	591908.6	660644.8	3230.875
		S4-09	591146.8	661303.2	3239.342
		S4-10	590402.5	661982.3	3247.866
		S4-11	589640.8	662616.2	3269.357
		S4-12	588872.0	663303.1	3282.448
		S4-13	588141.2	663947.9	3316.991
		S4-14	587369.8	664584.1	3402.804
		S4-15	586670.0	665199.1	3408.872
		S4-16	585879.0	665900.0	3408.39
		S4-17	585117.5	666547.7	3384.154
		S4-18	584361.3	667211.1	3425.503
HB-SM5	HB Crescent	S5-01	585355.6	670123.1	3437.653
		S5-02	583869.3	670338.4	3356.071
		S5-03	583420.8	670454.2	3344.266
		S5-04	582421.9	670612.2	3323.083
		S5-05	581441.0	670780.1	3328.142
		S5-06	580427.3	670951.7	3323.934
		S5-07	579453.5	671121.4	3321.956
		S5-08	578470.8	671273.2	3340.789
		S5-09	577515.3	671446.1	3363.368
		S5-10	576501.6	671595.6	3409.773
		S5-11	575525.3	671772.9	3448.679
		S5-12	574664.0	672016.8	3481.281

APPENDIX A

Intrepid Request for Installation of HB Project Subsidence Monitoring Network and BLM Approval Letter

INTREPID

May 28, 2009

Mr. Jim Stovall
Bureau of Land Management
Field Manager-Carlsbad Field Office
620 E. Greene St.
Carlsbad, NM 88220

RE: Application for Modification of Long Range Mine & Reclamation Plan – HB Potash

Dear Mr. Stovall:

Intrepid Potash – NM, LLC. is requesting approval to modify the 1977 HB Potash Long Range Mine & Reclamation Plan by initiating a Subsidence Monitoring Program at the HB Potash Mine. This on-going work will be incorporated into the current Environmental Impact Study that will be completed for the HB In-Situ Project.

The referenced subsidence monitoring effort involves the installation surface monuments to allow continued measurement of surface movement. Five transects which start outside the potential subsidence footprint and extend through the proposed flooded zone are proposed. Flush (to ground surface), 5' deep by 6" diameter concrete plugs will be installed at 1000' foot intervals along the transects. Each concrete plug will be equipped with a steel rod and flush brass head to facilitate elevation measurements over time. Thirty-six existing core holes and proposed injection / extraction wells are also targeted to be used as part of the subsidence monitoring network. Additional significant surface features and infrastructure defined in the surface Right-of-Way effort may also be included as specific subsidence monitoring points.

Please feel free to contact me if you have any questions or concerns regarding this letter or the drawing enclosed.

Sincerely,

Intrepid Potash – NM, LLC.

Thomas A. McGuire
Chief Mine Engineer

Enclosures:

Technical Memorandum {September 29, 2008}
Figure DP-003-1A {Transect Monument Design}

P.O. BOX 101 • 35 MILES EAST HIGHWAY 62-180 • CARLSBAD, NEW MEXICO • 88220

PHONE: (505) 234-3814 • FAX: (505) 887-0929

TECHNICAL MEMORANDUM

Proposed Subsidence Monitoring Program

HB In-Situ Project
HB Potash LLC
Eddy County, New Mexico

September 29, 2008

As defined in the Discharge Permit submitted March 10, 2008 to the NMED, the HB In-Situ project is expected to have minimal (if any) subsidence impacts throughout the surface areas above the flooded/mined out areas of HB. This Technical Memorandum is intended to propose a subsidence monitoring program that will allow for surface monitoring throughout the life of the project.

During the early 1960's, Potash Company of America (now HB Potash) conducted a convergence program. The benefit they had at the time of the project was the capability to set underground instrumentation and correlate these locations with a surface site. Unfortunately for the In-Situ project, those locations are not within the proposed flood areas.

HB Potash proposes to monitor subsidence using existing core holes as well as establishing several transects which cross the proposed flooded workings. All monitoring points will be measured on a regular basis throughout mining using a portable GPS instrument. One of the primary benefits of this approach is that actual field data will be collected, not only in GPS data but actual visual verification of all sites.

Core Hole Monitoring Program

Twenty-four existing core holes will be monitored using GPS instrumentation. The core hole locations are shown on **Figure DP-003-1, Subsidence Monitoring Program**. Each core hole has an established bench mark which will be used for the actual measurement. Each core has also been surveyed to provide a reference location / elevation to the existing coordinate system. The following activities will be conducted:

1. Locate core holes within the initial flood zone.
2. Locate core holes outside of the initial flood zone.
3. Research elevations of all core holes.
4. GPS all core hole locations to acquire a baseline of data.

5. Monitor all core holes on a quarterly schedule. The first date of data collection will occur approximately 6 months prior to initial flooding and proceed until solution mining is completed.
6. All data will be recorded in a data base and reported to appropriate authorities on an annual basis.

Subsidence Transects

Five linear transects will be established which bisect each of the workings areas as follows:

Transect	Flooded Working
HB-SM1	HB Eddy
HB-SM2	HB South
HB-SM3	HB North
HB-SM4	HB North
HB-SM5	HB Crescent

The transects have been positioned to start outside the 45 degree extension zone of the existing workings, proceed through the flooded zone, proceed through workings not scheduled for flooding, and extending out past the 45 degree extension zone. Figure DP-003-1 illustrates the locations of the transects. Subsidence monuments will be established along each transect at approximate 1000 foot intervals. The monument design is shown on Figure DP-003-1. Each transect will be surveyed and each monument will be measured on a quarterly basis with GPS instrumentation. The following activities will be conducted:

1. Locate the transect locations on the ground.
2. Survey each transect.
3. GPS all core hole locations to acquire a baseline of data.
4. Monitor all core holes on a quarterly schedule. The first date of data collection will occur approximately 6 months prior to initial flooding and proceed until solution mining is completed.
5. All data will be recorded in a data base and reported to appropriate authorities on an annual basis.

Attachments:

Spreadsheet with chosen core holes and relevant data

Figure DP-003-1

Intrepid Potash - NM, LLC.
Carlsbad, NM

HB In-Situ Project
subsidence Moniting Program

North Mine Workings

HOLE ID	TOWNSHIP	RANGE	SECTION	Loc/N,S	Loc/E,W	Collar Elev.	Collar Elev. Base GPS	Collar Elev. GPS Date	Collar Elev. GPS Date	Remarks
PCA-11	20S	30E	3	519 FN	320 FW	3,213				
PCA-12	19S	30E	34	50 FS	50 FE	3,214				
PCA-23	19S	30E	39	2000 FS	175 FW	3,400				
PCA-45	20S	30E	3	1691.1 FS	2092.03 FW	3,208				
PCA-46	20S	30E	2	1375.8 FS	60.9 FE	3,186				Outside of Open Works
PCA-48	20S	30E	23	2161 FS	2041 FW	3,332				
PCA-77	19S	30E	35	2008 FN	1941 FE	3,279				

South Mine Workings

HOLE ID	TOWNSHIP	RANGE	SECTION	Loc/N,S	Loc/E,W	Collar Elev.	Collar Elev. Base GPS	Collar Elev. GPS Date	Collar Elev. GPS Date	
PCA-69	20S	30E	20	2470 FN	2490 FE	3,223				
PCA-70	20S	30E	20	399 FN	23 FE	3,223				
PCA-71	20S	30E	20	97 FN	2640 FE	3,298				
USP-119	20S	30E	29	1320 FN	1320 FE	3,398				Outside of Open Works

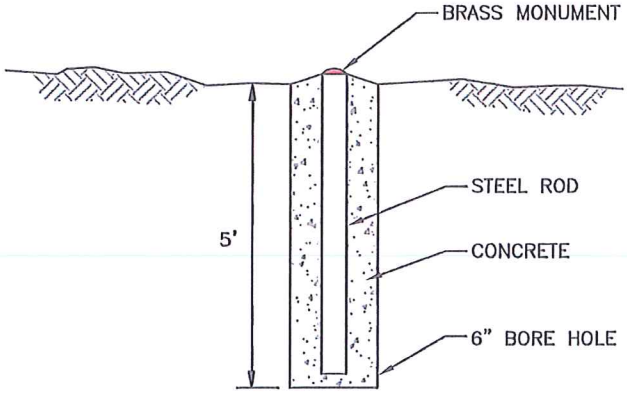
Eddy Mine Workings

HOLE ID	TOWNSHIP	RANGE	SECTION	Loc/N,S	Loc/E,W	Collar Elev.	Collar Elev. Base GPS	Collar Elev. GPS Date	Collar Elev. GPS Date	
PCA-9	20S	29E	23	70 FS	2710 FE	3,305				
PCA-19	20S	29E	22	2640 FS	75 FE	3,290				
PCA-25	20S	29E	23	86.5 FS	246.8 FE	3,311				Above Flood Line
PCA-27	20S	29E	23	81.9 FN	80.7 FE	3,297				
USP-65	20S	29E	15	562 FN	337 FE	3,282				
USBM-2	20S	29E	14	233 FN	235 FE	3,313				
USBM-7	20S	29E	25	2640 FN	2640 FE	3,312				
USBM-11	20S	29E	35	2640 FN	2590 FE	3,310				Outside of Open Works

Crescent Mine Workings

HOLE ID	TOWNSHIP	RANGE	SECTION	Loc/N,S	Loc/E,W	Collar Elev.	Collar Elev. Base GPS	Collar Elev. GPS Date	Collar Elev. GPS Date	Notes
USP-29	20S	31E	7	1640 FN	1000 FW	3,327				Outside of Open Works
USP-76	20S	31E	7	292 FN	2307 FW	3,334				
USP-142	20S	31E	7	1788 FN	21 FW	3,355				
DSP-73	20S	31E	6	1287 FS	1380 FW	3,330				
DSP-76	20S	31E	7	292 FN	2307 FW	3,426				Above Flood Line

TRANSECT MONUMENT DESIGN



NOTES:

1. FINAL TRANSECT/MONUMENT LOCATIONS MAY CHANGE BASED ON SITE LOGISTICS AND ACCESS.

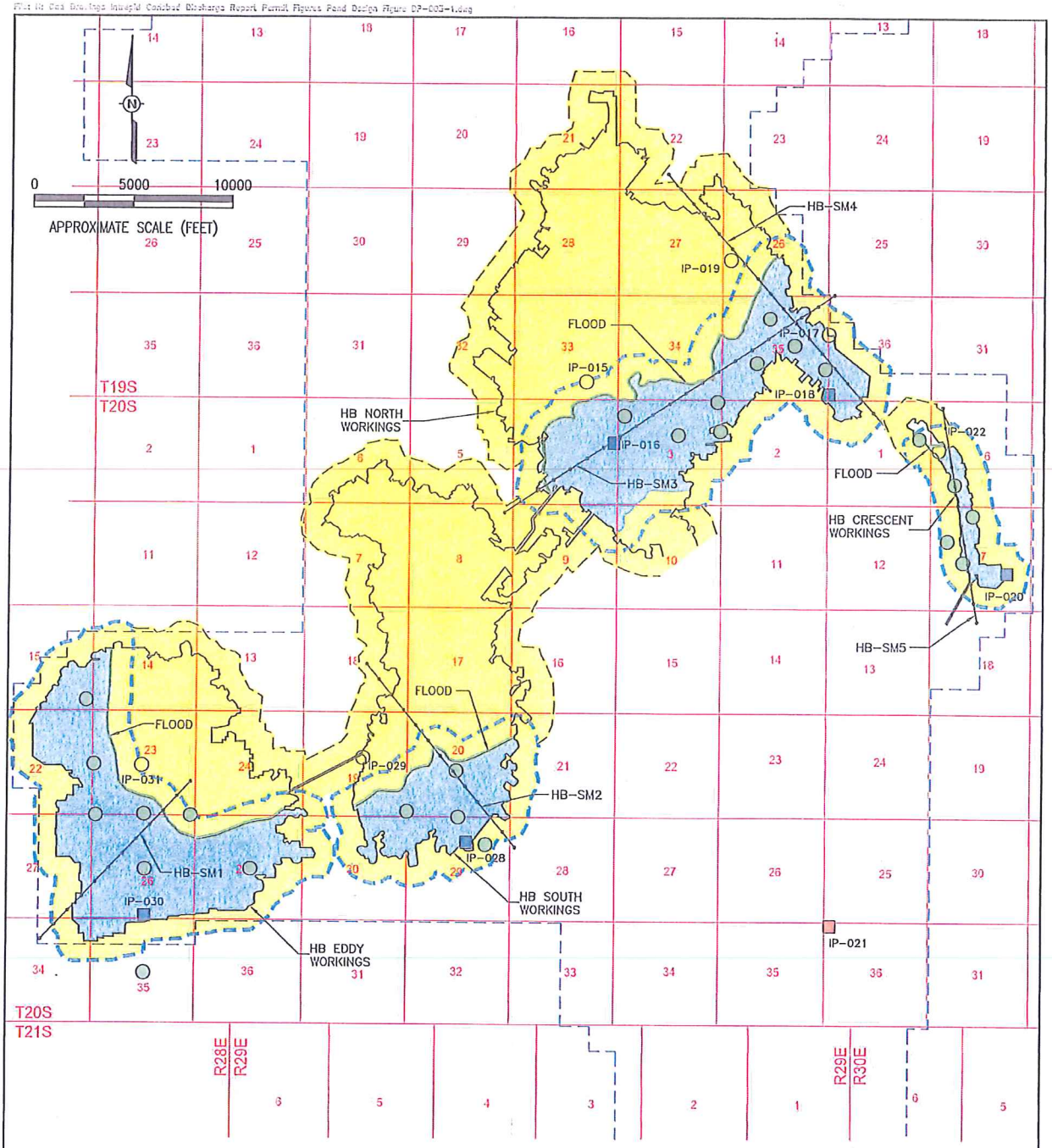
2. MONUMENTS WILL BE ESTABLISHED AT APPROXIMATE 1000' INTERVALS (AS PER DESIGN DETAIL SHOWN) ALONG EACH TRANSECT.

3. QUARTERLY MEASUREMENTS VIA GPS.

4. TRANSECTS TO EXTEND BEYOND STRESS FRACTURE ZONE.

5. THE DESIGN PRESENTED HERE IS SUBJECT TO CHANGES BASED ON FINAL ENGINEERING

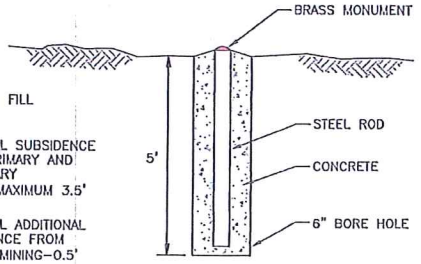
INTREPID POTASH	Shaw° ENVIRONMENTAL & INFRASTRUCTURE	HB IN-SITU PROJECT HB POTASH, LLC EDDY COUNTY, NEW MEXICO	FIGURE NO. DP-003-1A
		SUBSIDENCE MONITORING PROGRAM	PROJECT NO. 124305



EXPLANATION

- PROJECT AREA
- SECTION LINE
- 2 — SECTION NUMBER
- EXTENT OF MINE WORKINGS
- IP-015 — INJECTION WELL
- IP-016 — EXTRACTION WELL
- IP-021 — MONITORING/ EXTRACTION WELL
- USBM-11 — EXISTING COREHOLES TO BE USED FOR SUBSIDENCE MONITORING
- NEW ESTABLISHED SUBSIDENCE MONITORING TRANSECTS (1000' SPACING)
- MAXIMUM FILL
- POTENTIAL SUBSIDENCE FROM PRIMARY AND SECONDARY MINING-MAXIMUM 3.5'
- POTENTIAL ADDITIONAL SUBSIDENCE FROM IN-SITU MINING-0.5' MAXIMUM

TRANSECT MONUMENT DESIGN



NOTES:

1. FINAL TRANSECT/MONUMENT LOCATIONS MAY CHANGE BASED ON SITE LOGISTICS AND ACCESS.
2. MONUMENTS WILL BE ESTABLISHED AT APPROXIMATE 1000' INTERVALS (AS PER DESIGN DETAIL SHOWN) ALONG EACH TRANSECT.
3. QUARTERLY MEASUREMENTS VIA GPS.
4. TRANSECTS TO EXTEND BEYOND STRESS FRACTURE ZONE.
5. THE DESIGN PRESENTED HERE IS SUBJECT TO CHANGES BASED ON FINAL ENGINEERING

REV	DATE	DESCRIPTION	DSN BY	DES BY	CK BY	APP BY
DATE OF ISSUE Feb 2005		DSN BY J. Coddington DES BY Beth Schoonmaker			CK BY APP BY	

INTREPID POTASH

Shaw ENVIRONMENTAL & INFRASTRUCTURE

HB IN-SITU PROJECT
HB POTASH, LLC
EDDY COUNTY, NEW MEXICO

SUBSIDENCE MONITORING PROGRAM

FIGURE NO. DP-003-1

PROJECT NO. 124305