HOMESTAKE MINING COMPANY OF CALIFORNIA

Grants Reclamation Project

SPECIFICATIONS:
1200 GPM Zeolite System Construction

ENGINEER'S CERTIFICATE

I HEREBY CERTIFY, THAT I HAVE PREPARED OR DIRECTLY SUPERVISED THE PREPARATION OF THESE SPECIFICATIONS, AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NEW MEXICO.

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5831 N.M. 3/6/2015

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Acronyms and Abbreviations

ALARA	as low as (is) reasonably achievable
ATV	All-Terrain Vehicle
C	Centigrade
DWV	Drain - Waste – Vent
F	Fahrenheit
FLRA	Field Level Risk Assessment
ft or FT	feet
GRI	Geosynthetic Research Institute
HDPE	High Density Polyethylene
HMC	Homestake Mining Company
in.	inch
kN	kilonewton (metric unit of force)
kPa	kilopascal (metric unit of pressure)
lb	pound
LTP	Large Tailings Pile
m or M	meter
mm	millimeter
MSL	Mean Sea Level
Pa	Pascal (metric unit of pressure)
psig	pounds per square inch guage
psi	pounds per square inch
QA	Quality Assurance
QC	Quality Control
regen	regeneration
RO	Reverse Osmosis

CS 1 MOBILIZATION AND LAYDOWN AREA

This section consists of procedures for CONTRACTOR(S) mobilization and demobilization and the development of the equipment and mobile office laydown area for the water treatment system construction located on the site large tailings pile (LTP). In addition, general safety requirements for working on the site are described.

CS 1.1 MOBILIZATION AND DEMOBILIZATION

A. The CONTRACTOR(S) shall mobilize their equipment, personnel, and supplies into the site to conduct preparatory site work for the construction project. This work will include the equipment, personnel, and supplies necessary to maintain or develop access roads and establish the contractor laydown area. Once the laydown area is established and approved by the MANAGER, CONTRACTOR(S) shall begin mobilization of their remaining equipment, personnel, and supplies to the laydown area in preparation of completing the project.

B. Following completion of all construction tasks and commissioning of the water treatment system and final approval by the MANAGER, the CONTRACTOR(S) shall demobilize their equipment, personnel, and remaining supplies from the laydown area. Reclamation equipment and supplies will remain onsite until revegetation of the laydown area and borrow soil areas are complete (See CS 19).

CS 1.2 TRAINING

All CONTRACTOR personnel must be trained in site safety and radiological control procedures prior to being allowed to work on the LTP.

CS 1.2.1 RADIOLOGICAL CONTROL

A. All CONTRACTOR personnel who have not been previously trained in radiological control procedures shall receive training prior to being allowed to work on the LTP. This training, referred to as ALARA training, will be conducted by Homestake Mining Company (HMC) employees.

B. Each trained employee shall be issued a radiation badge to be worn at all times on the LTP. The badge must be stored in the construction office trailer(s) located at the laydown area at the end of each work shift and will not be allowed to leave the work site.

C. The MANAGER, or his personnel, shall have access to the trailer to monitor the badge storage. Radiological scanning of all equipment arriving at the site and prior to leaving the site shall occur according to HMC policy,

CS 1.2.2 SAFETY

A. All new CONTRACTOR personnel shall be required to attend a safety procedures training session to be conducted by HMC personnel prior to being allowed to work on the site. Included will be instruction of construction traffic patterns and speed limits, HMC personnel traffic patterns, and coordination and traffic control in relation to other site contractors.

B. All CONTRACTOR personnel shall be instructed in the work site Field Level Risk Assessment (FLRA) process to determine the risk associated with any new or unusual activity.

C. The CONTRACTOR shall be required to hold a morning safety "tailgate" meeting with all site personnel.

CS 1.3 LAYDOWN AREA

The CONTRACTOR(S) laydown area is shown on Sheet 3 of the drawings and is generally located to the west of Evaporation Pond #3. This area was previously used for staging of equipment during the previous borrow soil haulage project.

CS 1.3.1 EQUIPMENT AND SUPPLIES

A. The laydown area shall be graded to accommodate equipment, trailers, and supplies. Soil shall be bladed and stockpiled from the laydown area for use as final cover of the area (See CS 19). It is understood that the original topsoil has likely been removed from the area during borrow soil excavation activities. The CONTRACTOR shall <u>not</u> be allowed to disturb more acreage than that exposed during borrow soil activities.

B. All equipment shall be required to be moved to the laydown area each evening following construction activities on the LTP. Routine servicing, fueling and repairs of all equipment shall be at the laydown area. The exception to this requirement is low mobility equipment, such as dozers and tracked excavators.

C. Fuel storage shall be placed on bermed containment at the laydown area. Mobile fuel trucks are acceptable and do not require containment.

CS 1.3.2 OFFICE TRAILERS AND OTHER FACILITIES

A. The CONTRACTOR shall be required to locate an office trailer(s) at the laydown area. The trailer(s) should be sufficient to supply office space for the contractor and his assistants.

B. In addition, the trailer(s) must have sufficient space for a lunchroom capable of supporting all employees. Employees must eat their lunches at the laydown area and shall <u>not</u> be allowed to eat on the LTP.

C. The CONTRACTOR must supply potable drinking water at the laydown area for employees to drink and to wash prior to eating lunch.

D. Portable toilet(s) must be supplied at the laydown area.

E. The trailers shall have sufficient space to store personnel radiation badges at the end of each work shift.

CS 1.3.3 ACCESS ROAD MAINTENANCE AND SPEED CONTROL

A. The CONTRACTOR shall be required to maintain all work site access roads including from the county road to the laydown site as shown on Sheet 3. This area will have a mandatory speed limit of 15 miles per hour. The road shall be maintained in a manner that allows for safe transport and movement of all equipment and dust control (see CS 3) is mandatory.

B. The access road up to the top of the LTP and the access roads to and from the construction area on the LTP must also be maintained by the CONTRACTOR. These roads, as shown on Sheet 3, have a mandatory speed limit of ~~20~~ 15 miles per hour. These roads also require dust control measures be employed.

C. The main gate to the work site on the LTP is also be utilized by other site contractors. Coordination with traffic of all contractors is required at all times. Delivery of materials and supplies shall also occur through these gates. All deliveries must be met by a CONTRACTOR representative to lead the delivery vehicle to the designated off-loading area on the LTP.

CS 2 STORMWATER CONTROL

This section describes the requirements to control stormwater runoff during the construction project.

CS 2.1 LARGE TAILINGS PILE RUNOFF

The construction project location is primarily on top of the large tailings pile (LTP) at the site. Much of the construction timeframe will occur during seasonal monsoon rains. Surface runoff from storm events on top of the LTP drains to the outer road system along the LTP berm to concrete control structures and drain pipes that flow to the bottom of the LTP. The surface of the LTP is domed in the middle, generally from east to west, and allows surface runoff to drain towards the outer berms of the LTP.

A. The CONTRACTOR is required to maintain the access roads during construction (CS 1). As part of this maintenance, the CONTRACTOR must blade the roads so that runoff will flow to the concrete structures located in the outer berm of the LTP.

B. The MANAGER, at his discretion, may direct additional grading of the roads to ensure compliance with this requirement.

CS 2.2 LAYDOWN AREA RUNOFF

A. The CONTRACTOR shall control surface runoff from the equipment laydown area within the confines of the area. As necessary, the CONTRACTOR may construct a small holding pond or berms, or install waddles, to control runoff. This requirement is necessary to avoid contaminants from the laydown area reaching off-area drainages.
B. The MANAGER, at his discretion may direct additional grading of the laydown area to ensure compliance with this requirement.

CS 3 DUST CONTROL AND WATERING

This section consists of requirements for water application by the CONTRACTOR(S) for dust control for the safety of all personnel and to reduce nuisance dust from leaving the construction area. In addition, water application is required in the compaction of the zeolite cell pad and embankments.

CS 3.1 WATER SOURCE

A. Water required for dust control, compaction, or other purposes shall be obtained from the water load out facility located at the water tower situated southeast of the LTP.

B. Alternative water sources may be utilized upon approval by the MANAGER.

CS 3.2 DUST CONTROL

A. The CONTRACTOR is required to control road and fugitive dust at all times during construction (see CS 1.3.3). Included in the dust control requirement are the access road to the laydown area and all LTP access roads.

B. The CONTRACTOR is required to maintain control of construction site fugitive dust to ensure that blowing dust particles do not leave the construction site causing safety hazards or air pollution.

C. Water distribution equipment shall be approved by the MANAGER.

D. The MANAGER, at his discretion, may direct additional watering of roads or the construction site to control dust.

CS 3.3 COMPACTION WATERING

A. Per the requirements of CS 4.5.1, Moisture and Density Control, water is required to ensure deficiency in moisture content of embankment and other materials does not occur.

B. These deficiencies shall be corrected by the addition of water by MANAGER approved water distribution equipment.

C. Pre-wetting of stockpiled soil prior to placement does not guarantee that additional water will not be required.

D. Water added to the pad area during construction operations shall be distributed in a manner that will avoid ponding or over-wetting materials.

CS 4 PAD CONSTRUCTION AND COMPACTION

CS 4.1 GENERAL

This section consists of construction and compaction of all zeolite pad materials in accordance with the specifications and in conformity with the lines, grades, thicknesses, and cross sections shown on the plans.

CS 4.2 TESTING PROCEDURE REFERENCES

The following testing procedures may be required in the earthen construction of the zeolite pad.

A: ASTM D4318: Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

B: ASTM D698: Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

C: ASTM D1556: Density and Unit Weight of Soil in Place by the Sand Cone Method.

D: ASTM D5195: Density of Soil and Rock In-Place at Depths Below the Surface by Nuclear Method.

E: ASTM D2922: Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Method (Shallow Depth).

CS 4.3 BORROW MATERIALS

Materials to be used for construction have been previously excavated and hauled to the construction site and stockpiled adjacent to the construction area. This material has been measured for volume and approved by a Geotechnical Engineer for suitability as construction material. Testing results for borrow soils are included in Appendix A. Approximately 50,000 CY of soil was originally stockpiled. However, a significant volume of stockpiled material has been placed as cover over the general construction area. A small volume of the stockpiled material was also removed for incidental use at the site. If the remaining borrow soil is not sufficient to complete the construction of the zeolite system, additional materials will be delivered to the area of the stockpile under separate contract.

ninety-five (95) percent of maximum dry density for the borrow soil as determined by ASTM D698.

4. MANAGER may approve minor grading, scarifying, moisture conditioning, or addition of small thickness of fill to smooth the foundation surface and improve uniformity of compaction.

B. The zeolite pad foundation shall be tested for soft spots by proof rolling. The proof roll test shall be done after passing the in-place compaction tests. Copies of the passing compaction tests, including the density testing, shall be provided to the MANAGER prior to the proof roll. Each succeeding pass of the proof roller over the pad area shall be offset by no greater than four (4) tire widths. The proof roller shall be uniformly loaded.

1. The proof roller shall be the weight of a fully loaded ten (10) yard dump truck (approx. 50,000 lbs. or more on ten (10) wheels).

2. Areas which exhibit movement, cracking, or deflection of the material shall be removed and replaced or recompacted and retested at the direction of the MANAGER.

CS 4.5 CONSTRUCTION

A. All excavation and embankment work shall be constructed to the neat lines and elevations shown on the plans. No materials shall be wasted without permission from the MANAGER. All grading and related operations shall be conducted so that the terrain outside of the limits of slopes shall <u>not</u> be disturbed unless approved by the MANAGER. Only minor additional clearing of the site will be required.

B. If it should become necessary to suspend grading operations because of weather or other conditions, the CONTRACTOR shall, at the direction of the MANAGER, perform minor blading or grading to reduce or prevent collection of water within the pad area.

C. Embankment material shall be placed in uniform approximate horizontal layers not exceeding eight (8) inches in loose thickness, for the entire width of the embankment. Each layer of embankment shall be completed, leveled and compacted before succeeding layers are placed.

D. Embankment which has been subjected to significant freezing shall be retested for compaction requirements after frost is out of the ground and the embankment is in suitable condition of work.

CS 4.5.1 MOISTURE AND DENSITY CONTROL

A. The CONTRACTOR shall provide watering and compaction as required to obtain a minimum of ninety-five (95) percent of maximum dry density as determined by ASTM D698 for the entire embankment placed. In the case of embankment materials with plasticity indexes greater than zero (0) as determined by ASTM D4318, the amount of water required for rolling shall be within plus two (2) or minus two (2) percentage points of optimum moisture content as determined by ASTM D698. Tests shall be performed using ASTM D2922, D1556, or D5195. If testing is performed with ASTM D2922 or ASTM D5195 a minimum of two calibration tests will be performed by duplicate testing with ASTM D1556.

B. Frequency of density testing shall be one test for every two thousand (2,000) cubic yards of compacted material. At least one density test shall be performed for each work shift during which one thousand (1,000) or more cubic yards of material are compacted. Additional testing may be required at the direction of the MANAGER to confirm adequate compaction for critical areas of the embankment.

C. Moisture conditioning of the fill material will be allowed within the stockpile borrow area. When moisture conditioning is performed in the stockpile borrow area, the borrow soil shall be thoroughly mixed by blading, rototilling or scarifying to ensure uniform moisture content within the active borrow area.

D. Moisture content adjustment of the fill material will be allowed within the zeolite pad construction area. After addition of water, the entire lift thickness of up to eight (8) inches shall be bladed, rototilled or scarified to thoroughly mix the soil to achieve uniform moisture content before compaction. If it is necessary to reduce moisture content, the material will be periodically bladed, rototilled or scarified to thoroughly mix the soil to achieve uniform moisture content. Alternatively, the CONTRACTOR may remove and replace the fill.

CS 4.5.2 COARSE GRADING AND CONSTRUCTION

A. The CONTRACTOR shall construct the zeolite pad embankments in a manner that produces compaction of all major embankment fill material. Excess fill shall be placed on the interior of the zeolite cells such that

trimming of the steeper 1H:1V interior slopes to the lines and grades shown on the drawings will occur in compacted fill. Portions of the fill that are disturbed during construction shall be re-compacted.

B. Exterior slopes and interior slopes shall be placed to produce acceptable compaction through the fill. The fill material on slopes equal to or flatter than 2H:1V may be placed to approximate final grade with no excess fill.

C. All soft and unstable material and other portions of the compacted fill which exhibit movement, cracking, or deflection, or do not meet minimum density requirements and cannot be compacted satisfactorily, shall be removed and replaced to the lines and grades as directed.

CS 4.5.3 FINE GRADING

A. Trimming of steep interior zeolite pad slopes shall be done to achieve the lines and grades as directed. Equipment operators working in close proximity to steeper interior slopes shall be trained in safe operating procedures. Because of safety concerns for equipment operating near steep slopes, MANAGER may suspend equipment operations until safety concerns are addressed.

B. All soft and unstable material and other portions of the compacted fill which exhibit movement, cracking, or deflection, or do not meet minimum density requirements and cannot be compacted satisfactorily, shall be removed and replaced to the lines and grades as directed.

CS 5 LINER INSTALLATION

HDPE geomembrane (liner) will be installed over the entire internal area of the zeolite system to provide containment for all fluids and materials within the exterior berm and perimeter access road. All provided liner shall be 60 mil thickness with smooth black-surfaced HDPE geomembrane.

CS 5.1 GENERAL

This specification includes furnishing and installing HDPE geomembranes with a formulated sheet density of 0.940 g/cm or greater.

CS 5.1.1 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D 638, Standard Test Method for Tensile Properties of Plastics.
2. D 751, Standard Test Methods for Coated Fabrics.
3. D 792, Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
4. D 1004, Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.
5. D 1204, Standard Test Method for Linear Dimensional Changes of Non Rigid Thermoplastic Sheeting or Film at Elevated Temperature.
6. D 1238, Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer.
7. D 1505, Standard Test Method for Density of Plastics by Density-Gradient Technique.
8. D 1603, Standard Test Method for Carbon Black in Olefin Plastics.
9. D 3895, Test Method for Oxidative Induction Time of Polyolefins by Thermal Analysis.
10. D 4218, Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique.
11. D 4437, Standard Practice for Determining the Integrity of Field Seams Used in Joining Flexible Polymeric Sheet Geomembranes.
12. D 4833, Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products.
13. D 5199, Standard Test Method for Measuring Nominal Thickness of Smooth Geomembranes.
14. D 5397, Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefins using Notched Constant Tensile Load Test.

15. D 5596, Standard Practice for Microscopical Examination of Pigment Dispersion in Plastic Compounds.
16. D 5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.
17. D 5721, Practice for Air-Oven Aging of Polyolefin Geomembranes.
18. D 5820, Test Method for Air Testing.
19. D 5885, Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High Pressure Differential Scanning Calorimetry.
20. D 5994, Standard Test Method for Measuring Nominal Thickness of Textured Geomembranes.
21. D 6365, Standard Practice for the Nondestructive Testing of Geomembrane Seams using The Spark Test.

B. Geosynthetic Research Institute (GRI):
1. GRI GM 6, Pressurized Air Channel Test for Dual Seamed Geomembranes.
2. GRI GM 9, Cold Weather Seaming of Geomembranes.
3. GRI GM 10, Specification for Stress Crack Resistance of HDPE Geomembrane Sheet.
4. GRI GM 13, Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes.
5. GRI GM 14, Test Frequencies for Destructive Seam Testing.

CS 5.1.2 SUBMITTALS

A. Submit the following to the MANAGER, for review and approval, within a reasonable time so as to expedite shipment or installation of the Geomembrane:
1. Documentation of manufacturer's qualifications.
2. Manufacturer's Quality Control program manual or descriptive documentation.
3. A material properties sheet, including at a minimum all properties specified in GRI GM 13, including test methods used.
4. Sample of the material.
5. Documentation of Installer's qualifications, as specified below.
    a. Submit a list of at least ten completed facilities. For each installation, provide: name and type of facility; its location; the date of installation; name and telephone number of contact at the facility; type and thickness of geomembrane and; surface area of the installed geomembrane.
    b. Submit resumes or qualifications of the Installation Supervisor, Master Seamer and Technicians to be assigned to this project.
    c. Quality Control Program.

6. Example Material Warranty and Liner Installation Warranty complying with following sections of this specification.

7. Resin Supplier's name, resin production plant identification, resin brand name and number, production date of the resin, resin Manufacturer's quality control certificates, and certification that the properties of the resin meet the requirements for the project.

B. Shop Drawings

1. Submit copies of shop drawings for MANAGER'S approval within a reasonable time so as not to delay the start of geomembrane installation. Shop drawings shall show the proposed panel layout identifying seams and details. Seams should generally follow the direction of the slope. Butt seams or roll-end seams should not occur on a slope unless approved by the MANAGER. Butt seams on a slope, if allowed, should be staggered.

2. Placement of geomembrane will not be allowed to proceed until MANAGER has received and approved the shop drawings.

D. Additional Submittals (In-Progress and at Completion)

1. Manufacturer's warranty.
2. Geomembrane installation warranty.
3. Daily written acceptance of subgrade surface.
4. Low-temperature seaming procedures if applicable.
5. Prequalification test seam samples.
6. Field seam non-destructive test results.
7. Field seam destructive test results.
8. Daily field installation reports.
9. Installation record drawing.

CS 5.1.3 QUALITY CONTROL

A. Manufacturer's Qualifications: The manufacturer of geomembrane of the type specified or similar product shall have at least five years of experience in the manufacture of such geomembrane. In addition, the geomembrane manufacturer shall have manufactured at least 1,000,000 M^2 (10,000,000 FT^2) of the specified type of geomembrane or similar product during the last five years.

B. Installer's Qualifications

1. The Geomembrane Installer shall be the Manufacturer, approved Manufacturer's Installer or a contractor approved by the MANAGER to install the geomembrane.
2. The Geomembrane Installer shall have at least three years of experience in the installation of the specified geomembrane or similar. The Geomembrane Installer shall have installed at least 10 projects involving a total of 500,000 M^2 (5,000,000FT^2) of the specified type of geomembrane or similar during the last three years.
3. Installation shall be performed under the direction of a field Installation Supervisor who shall be responsible throughout the geomembrane installation, for geomembrane panel layout, seaming, patching, testing, repairs, and all other activities of the Geomembrane Installer. The Field Installation Supervisor shall have installed or supervised the installation and seaming of a minimum of 10 projects involving a total of 500,000 M^2 (5,000,000 FT^2) of geomembrane of the type specified or a similar product.
4. Seaming shall be performed under the direction of a Master Seamer (who may also be the Field Installation Supervisor or Crew Foreman) who has seamed a minimum of 300,000M^2 (3,000,000FT^2) of geomembrane of the type specified or similar product, using the same type of seaming apparatus to be used in the current project. The Field Installation Supervisor and/or Master Seamer shall be present whenever seaming is performed.
5. All seaming, patching, other welding operations, and testing shall be performed by qualified technicians employed by the Geomembrane Installer.

CS 5.1.4 DELIVERY STORAGE AND HANDLING

A. Each roll of geomembrane delivered to the site shall be labeled by the manufacturer. The label shall be firmly affixed and shall clearly state the manufacturer's name, product identification, material thickness, roll number, roll dimensions and roll weight.

B. Geomembrane shall be protected from mud, dirt, dust, puncture, cutting or any other damaging or deleterious conditions.

C. Rolls shall be stored away from high traffic areas. Continuously and uniformly support rolls on a smooth, level prepared surface.

D. Rolls shall <u>not</u> be stacked more than three high.

CS 5.1.5 PROJECT CONDITIONS

A. Geomembrane should not be installed in the presence of standing water, while precipitation is occurring, during excessive winds, or when material temperatures are outside the specified limits.

CS 5.1.6 MATERIAL WARRANTY

As required by specification, or as required in GRI GM 13.

CS 5.1.7 GEOMEMBRANE INSTALLATION WARRANTY

A. The Geomembrane Installer shall guarantee the geomembrane installation against defects in the installation and workmanship for 1 year commencing with the date of final acceptance.

CS 5.1.8 GEOMEMBRANE PRE-CONSTRUCTION MEETING

A. A Geomembrane Pre-Construction Meeting shall be held at the site prior to installation of the geomembrane. At a minimum, the meeting shall be attended by the Geomembrane Installer, MANAGER, and CONTRACTOR(S).

B. Topics for this meeting shall include:

1. Responsibilities of each party.
2. Lines of authority and communication. Resolution of any project document ambiguity.
3. Methods for documenting, reporting and distributing documents and reports.
4. Procedures for packaging and storing archive samples.
5. Review of time schedule for all installation and testing.
6. Review of panel layout and numbering systems for panels and seams including details for marking on geomembrane.
7. Procedures and responsibilities for preparation and submission of as-built panel and seam drawings.
8. Temperature and weather limitations. Installation procedures for adverse weather conditions. Defining acceptable subgrade, geomembrane, or ambient moisture and temperature conditions for working during liner installation.
9. Subgrade conditions, dewatering responsibilities and subgrade maintenance plan.
10. Deployment techniques including allowable subgrade for the geomembrane.

11. Plan for controlling expansion/contraction and wrinkling of the geomembrane.
12. Covering of the geomembrane and cover soil placement.
13. Measurement and payment schedules.
14. Health and safety.

C. The meeting shall be documented by a person designated at the beginning of the meeting and minutes shall be transmitted to all parties.

CS 5.2 PRODUCTS

CS 5.2.1 SOURCE QUALITY CONTROL

A. Manufacturing Quality Control

1. The test methods and frequencies used by the manufacturer for quality control/quality assurance of the above geomembrane prior to delivery, shall be in accordance with GRI GM 13, or modified as required for project specific conditions.
2. The manufacturer's geomembrane quality control certifications, including results of quality control testing of the products, must be supplied to the MANAGER to verify that the materials supplied for the project are in compliance with all product and or project specifications. The certification shall be signed by a responsible party employed by the manufacturer, such as the QA/QC Manager, Production Manager, or Technical Services Manager. Certifications shall include lot and roll numbers and corresponding shipping information.
3. The Manufacturer will provide Certification that the geomembrane and welding rod supplied for the project have the same base resin and material properties.

CS 5.2.2 GEOMEMBRANE

A. The geomembrane shall consist of new, first quality products designed and manufactured specifically for the purpose of this work which shall have been satisfactorily demonstrated by prior testing to be suitable and durable for such purposes. The geomembrane rolls shall be seamless, high density polyethylene (HDPE- Density >0.94g/cm) containing no plasticizers, fillers or extenders and shall be free of holes, blisters or contaminants, and leak free verified by 100% in line spark or equivalent testing. The geomembrane shall be supplied as a continuous sheet with no factory seams in rolls. The geomembrane will meet the property requirements as shown in Table CS 5-1 (GRI GM 13).

B. Material conformance testing by the MANAGER, if required, will be conducted in accordance with the project specifications.

C. The geomembrane seams shall meet the property requirements as shown in Table CS 5-2, (Attachment B) or as required by project specifications.

Table CS 5-1. Required HDPE Properties from GRI GM 13

Properties	Test Method	Test Value							Testing Frequency (minimum)
		30 mils	40 mils	50 mils	60 mils	80 mils	100 mils	120 mils	
Thickness (min. ave.)	D5199	nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Per roll
• lowest individual of 10 values		-10%	-10%	-10%	-10%	-10%	-10%	-10%	
Density mg/l (min.)	D 1505/D 792	0.940 g/cc	0.940 g/cc	0.940 g/cc	0.940 g/cc	0.940 g/cc	0.940 g/cc	0.940 g/cc	200,00 lb
Tensile Properties *(1)* (min. ave.) • yield strength • break strength • yield elongation • break elongation	D 6693 Type IV	 63 lb/in. 114 lb/in. 12% 700%	 84 lb/in. 152 lb/in. 12% 700%	 105 lb/in. 190 lb/in. 12% 700%	 126 lb/in. 228 lb/in. 12% 700%	 168 lb/in. 304 lb/in. 12% 700%	 210 lb/in. 380 lb/in. 12% 700%	 252 lb/in. 456 lb/in. 12% 700%	20,000 lb
Tear Resistance (min. ave.)	D 1004	21 lb	28 lb	35 lb	42 lb	56 lb	70 lb	84 lb	45,000 lb
Puncture Resistance (min. ave.)	D 4833	54 lb	72 lb	90 lb	108 lb	144 lb	180 lb	216 lb	45,000 lb
Stress Crack Resistance *(2)*	D5397 (App.)	300 hr.	300 hr.	300 hr.	300 hr.	300 hr.	300 hr.	300 hr.	per GRI-GM10
Carbon Black Content (range)	D 1603 *(3)*	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	20,000 lb
Carbon Black Dispersion	D 5596	note *(4)*	note *(4)*	note *(4)*	note *(4)*	note *(4)*	note *(4)*	note *(4)*	45,000 lb
Oxidative Induction Time (OIT) (min. ave.) *(5)* (a) Standard OIT — or — (b) High Pressure OIT	 D 3895 D 5885	 100 min. 400 min.	 100 min. 400 min.	 100 min. 400 min.	 100 min. 400 min.	 100 min. 400 min.	 100 min. 400 min.	 100 min. 400 min.	200,000 lb
Oven Aging at 85°C *(5), (6)* (a) Standard OIT (min. ave.) - % retained after 90 days — or — (b) High Pressure OIT (min. ave.) - % retained after 90 days	D 5721 D 3895 D 5885	 55% 80%	 55% 80%	 55% 80%	 55% 80%	 55% 80%	 55% 80%	 55% 80%	per each formulation
UV Resistance *(7)* (a) Standard OIT (min. ave.) — or — (b) High Pressure OIT (min. ave.) - % retained after 1600 hrs *(9)*	GM 11 D 3895 D 5885	 N.R. *(8)* 50%	 N.R. *(8)* 50%	 N.R. *(8)* 50%	 N.R. *(8)* 50%	 N.R. *(8)* 50%	 N.R. *(8)* 50%	 N.R. *(8)* 50%	per each formulation

(1) Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction.
Yield elongation is calculated using a gage length of 1.3 inches
Break elongation is calculated using a gage length of 2.0 in.
(2) The yield stress used to calculate the applied load for the SP-NCTL test should be the manufacturer's mean value via MQC testing.
(3) Other methods such as D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.
(4) Carbon black dispersion (only near spherical agglomerates) for 10 different views:
9 in Categories 1 or 2 and 1 in Category 3
(5) The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.
(6) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.
(7) The condition of the test should be 20 hr. UV cycle at 75°C followed by 4 hr. condensation at 60°C.
(8) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.
(9) UV resistance is based on percent retained value regardless of the original HP-OIT value.

Table CS 5-2. Minimum Average Weld Properties

Property	Test Method	60 mil (1.5mm)
Peel Strength (fusion), ppi (kN/m)	ASTM D 6392	98 (17.2)
Peel Strength (extrusion), ppi (kN/m)	ASTM D 6392	78 (13.7)
Shear Strength (fusion & ext.), ppi (kN/m)	ASTM D 6392	121 (21.2)

CS 5.3 INSTALLATION AND EXECUTION

CS 5.3.1 SUBGRADE PREPARATION

A. The subgrade shall be prepared in accordance with the project specifications. The geomembrane subgrade shall be uniform and free of all sharp or angular

objects that may damage the geomembrane prior to installation of the geomembrane.

B. The Geomembrane Installer and MANAGER shall inspect the surface to be covered with the geomembrane on each day's operations prior to placement of geomembrane to verify suitability.

C. The Geomembrane Installer and MANAGER shall provide daily written acceptance for the surface to be covered by the geomembrane in that day's operations. The surface shall be maintained in a manner, during geomembrane installation, to ensure subgrade suitability.

D. All subgrade damaged by construction equipment and deemed unsuitable for geomembrane deployment shall be repaired prior to placement of the geomembrane. All repairs shall be approved by the MANAGER and the Geomembrane Installer. This damage, repair, and the responsibilities of the CONTRACTOR and Geomembrane Installer shall be defined in the preconstruction meeting.

CS 5.3.2 GEOMEMBRANE PLACEMENT

A. No geomembrane shall be deployed until the applicable certifications and quality control certificates are submitted to and approved by the MANAGER. Should geomembrane material be deployed prior to approval by the MANAGER it will be at the sole risk of the Geomembrane Installer and/or CONTRACTOR. If the material does not meet project specifications it shall be removed from the work area at the direction of the MANAGER.

B. The geomembrane shall be installed to the limits shown on the project drawings and essentially as shown on approved panel layout drawings.

C. No geomembrane material shall be unrolled and deployed if the material temperatures are lower than 0 degrees C (32 degrees F) unless otherwise approved by the MANAGER. The specified minimum temperature for material deployment may be adjusted by the MANAGER based on recommendations by the manufacturer. Temperature limitations should be defined in the preconstruction meeting. Typically, only the quantity of geomembrane that will be anchored and seamed together in one day should be deployed.

D. No vehicular traffic shall travel on the unprotected geomembrane other than an approved low ground pressure All-Terrain Vehicle (ATV) or equivalent. MANAGER may approve placement of protective cover over geomembrane to allow vehicle traffic.

E. Sand bags or equivalent ballast shall be used as necessary to temporarily hold the geomembrane material in position under the foreseeable and reasonably - expected wind conditions. Sand bag material shall be sufficiently close- knit to prevent soil fines from working through the bags and discharging on the geomembrane.

F. Geomembrane placement shall not be done if moisture prevents proper subgrade preparation, panel placement, or panel seaming. Moisture limitations should be defined in the preconstruction meeting.

G. Damaged panels or portions of the damaged panels which have been rejected shall be marked and their removal from the work area recorded.

H. The geomembrane shall not be allowed to "bridge over" voids or low areas in the subgrade. In these areas, the geomembrane shall be to installed to rest in intimate contact with the subgrade.

I. Wrinkles caused by panel placement or thermal expansion should be minimized.

J. Considerations on Site Geometry: In general, seams shall be oriented parallel to the line of the maximum slope. In corners and odd shaped geometric locations, the total length of field seams shall be minimized. Seams shall not be located at low points in the subgrade unless geometry requires seaming at such locations and if approved by the MANAGER.

K. Overlapping: The panels shall be overlapped prior to seaming to whatever extent is necessary to affect a good weld and allow for proper testing. In no case shall this overlap be less than 75mm (3 in.).

CS 5.3.3 SEAMING PROCEDURES

A. Cold weather installations should follow guidelines as outlined in GRI GM9.

B. No geomembrane material shall be seamed when liner temperatures are less than 0 degrees C (32 degrees F) unless the following conditions are complied with:

1. Seaming of the geomembrane at material temperatures below 0 degrees C (32 degrees F) is allowed if the Geomembrane Installer can demonstrate to the MANAGER, using pre-qualification test seams, that field seams comply with the project specifications, the safety of the crew is ensured, and geomembrane material can be fabricated (i.e. pipe boots, penetrations, repairs. etc.) at sub-freezing temperatures.
2. The Geomembrane Installer shall submit to the MANAGER for approval, detailed procedures for seaming at low temperatures, possibly including the following:
    a. Preheating of the geomembrane
    b. The provision of a tent or other device if necessary to prevent heat losses during seaming and rapid heat losses subsequent to seaming.
    c. Number of test welds to determine appropriate seaming parameters.

C. No geomembrane material shall be seamed when the sheet temperature is above 75 degrees C (170 degrees F) as measured by an infrared thermometer or surface thermocouple unless otherwise approved by the MANAGER. This approval will be based on recommendations by the manufacturer and on a field demonstration by the Geomembrane Installer using prequalification test seams to demonstrate that seams comply with the specification.

D. Seaming shall primarily be performed using automatic fusion welding equipment and techniques. Extrusion welding shall be used where fusion welding is not possible such as at pipe penetrations, patches, repairs and short (less than a roll width) runs of seams.

E. Fishmouths or excessive wrinkles at the seam overlaps, shall be minimized and when necessary cut along the ridge of the wrinkles back into the panel so as to effect a flat overlap. The cut shall be terminated with a keyhole cut (nominal 10 mm (1/2 in) diameter hole) so as to minimize crack/tear propagation. The overlay shall subsequently be seamed. The key hole cut shall be patched with an oval or round patch of the same base geomembrane material extending a minimum of 150 mm (6 in.) beyond the cut in all directions.

CS 5.3.4 PIPE AND STRUCTURE PENETRATION SEALING SYSTEM

A. Provide penetration sealing system at pipe boot locations shown on project drawings.

B. Penetrations shall be constructed from the base geomembrane material, flat stock, prefabricated boots and accessories. The prefabricated or field fabricated assembly shall be field welded to the geomembrane so as to prevent leakage. This assembly shall be tested as outlined in following sections. Alternatively, where field non-destructive testing cannot be performed, attachments will be field spark tested by standard holiday leak detectors in accordance with ASTM 6365. Spark testing should be done in areas where both air pressure testing and vacuum testing are not possible.

a. Equipment for Spark testing shall be comprised of but not limited to: A hand held holiday spark tester and conductive wand that generates a high voltage.

b. The testing activities shall be performed by the Geomembrane Installer by placing an electrically conductive tape or wire beneath the seam prior to welding. A trial seam containing a non-welded segment shall be subject to a calibration test to ensure that such a defect (non-welded segment) will be identified under the planned machine settings and procedures. Upon completion of the weld, enable the spark tester and hold approximately 25mm (1 in) above the weld moving slowly over the entire length of the weld in accordance with ASTM 6365. If there is no spark the weld is considered to be leak free.

c. A spark indicates a hole in the seam. The faulty area shall be located, repaired and retested by the Geomembrane Installer.

d. Care should be taken if flammable gases are present in the area to be tested.

CS 5.3.5 FIELD QUALITY CONTROL

The MANAGER shall be notified prior to all pre-qualification and production welding and testing, or as agreed upon in the pre-construction meeting.

A. Pre-qualification Test Seams

1. Test seams shall be prepared and tested by the Geomembrane Installer to verify that seaming parameters (speed, temperature and pressure of welding equipment) are adequate.

2. Test seams shall be made by each welding technician and tested in accordance with ASTM D 4437 at the beginning of each seaming period. Test seaming shall be performed under the same conditions and with the

same equipment and operator combination as production seaming. The test seam shall be approximately 3.3 meters (10 feet) long for fusion welding and 1 meter (3 feet) long for extrusion welding with the seam centered lengthwise. At a minimum, tests seams should be made by each technician 1 time every 4–6 hours; additional tests may be required with changes in environmental conditions.

3. Two 25 mm (1 in) wide specimens shall be die-cut by the Geomembrane Installer from each end of the test seam. These specimens shall be tested by the Geomembrane Installer using a field tensiometer testing both tracks for peel strength and also for shear strength. Each specimen shall fail in the parent material and not in the weld, "Film Tear Bond"(F.T.D. failure). Seam separation equal to or greater than 10% of the track width shall be considered a failing test.

4. The minimum acceptable seam strength values to be obtained for all specimens tested are listed in Table CS 5-2. All four specimens shall pass for the test seam to be a passing seam.

5. If a test seam fails, an additional test seam shall be immediately conducted. If the additional test seam fails, the seaming apparatus shall be rejected and not used for production seaming until the deficiencies are corrected and a successful test seam can be produced.

6. A sample from each test seam shall be labeled. The label shall indicate the date, geomembrane temperature, number of the seaming unit, technician performing the test seam and pass or fail description. The sample shall then be given to the MANAGER for archiving.

B. Field Seam Non-destructive Testing

1. All field seams shall be non-destructively tested by the Geomembrane Installer over the full seam length before the seams are covered. Each seam shall be numbered or otherwise designated. The location, date, test unit, name of tester and outcome of all non-destructive testing shall be recorded and submitted to the MANAGER.

2. Testing should be done as the seaming work progresses, not at the completion of all field seaming, unless agreed to in advance by the MANAGER. All defects found during testing shall be numbered and marked immediately after detection. All defects found should be repaired, retested and remarked to indicate acceptable completion of the repair.

3. Non-destructive testing shall be performed using vacuum box, air pressure or spark testing equipment.

4. Non-destructive tests shall be performed by experienced technicians familiar with the specified test methods. The Geomembrane Installer shall

demonstrate to the MANAGER all test methods to verify the test procedures are valid.

5. Extrusion seams shall be vacuum box tested by the Geomembrane Installer in accordance with ASTM D 4437 and ASTM D 5641 with the following equipment and procedures:

a. Equipment for testing extrusion seams shall be comprised of but not limited to: a vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft rubber gasket attached to the base, port hole or valve assembly and a vacuum gauge; a vacuum pump assembly equipped with a pressure controller and pipe connections; a rubber pressure/vacuum hose with fittings and connections; a plastic bucket; wide paint brush or mop; and a soapy solution.

b. The vacuum pump shall be charged and the tank pressure adjusted to approximately 35 kPa (5 psig).

c. The Geomembrane Installer shall create a leak tight seal between the gasket and geomembrane interface by wetting a strip of geomembrane approximately 0.3m (12 in) by 1.2m (48 in) (length and width of box) with a soapy solution, placing the box over the wetted area, and then compressing the box against the geomembrane. The Geomembrane Installer shall then close the bleed valve, open the vacuum valve, maintain initial pressure of approximately 35 kPa (5 psig) for approximately 5 seconds. The geomembrane should be continuously examined through the viewing window for the presence of soap bubbles, indicating a leak. If no bubbles appear after 5 seconds, the area shall be considered leak free. The box shall be depressurized and moved over the next adjoining area with an appropriate overlap and the process repeated.

d. All areas where soap bubbles appear shall be marked, repaired and then retested.

e. At locations where seams cannot be non-destructively tested, such as pipe penetrations, alternate nondestructive spark testing or equivalent should be substituted.

f. All seams that are vacuum tested shall be marked with the date tested, the name of the technician performing the test and the results of the test.

6. Double Fusion seams with an enclosed channel shall be air pressure tested by the Geomembrane Installer in accordance with ASTM D 5820 and ASTM D 4437 and the following equipment and procedures:

a. Equipment for testing double fusion seams shall be comprised of but not limited to: an air pump equipped with a pressure gauge capable of generating and sustaining a pressure of 210 kPa (30 psig), mounted on a cushion to protect the geomembrane; and a manometer equipped with a sharp hollow needle or other approved pressure feed device.

b. The Testing activities shall be performed by the Geomembrane Installer. Both ends of the seam to be tested shall be sealed and a needle or other approved pressure feed device inserted into the tunnel created by the double wedge fusion weld. The air pump shall be adjusted to a pressure of 210 kPa (30 psig), and the valve closed. Allow 2 minutes for the injected air to come to equilibrium in the channel, and sustain pressure for 5 minutes. If pressure loss does not exceed 28 kPa (4 psig) after this five minute period the seam shall be considered leak tight. Release pressure from the opposite end verifying pressure drop on needle to ensure testing of the entire seam. The needle or other approved pressure feed device shall be removed and the feed hole sealed.

c. If loss of pressure exceeds 28 kPa (4 psig) during the testing period or pressure does not stabilize, the faulty area shall be located, repaired and retested by the Geomembrane Installer.

d. Results of the pressure testing shall be recorded on the liner at the seam tested and on a pressure testing record.

C. Destructive Field Seam Testing

1. One destructive test sample per 150 linear m (500 linear feet) seam length or another predetermined length in accordance with GRI GM 14 shall be taken by the Geomembrane Installer from a location specified by the MANAGER. The Geomembrane Installer shall <u>not</u> be informed in advance of the sample location. In order to obtain test results prior to completion of geomembrane installation, samples shall be cut by the Geomembrane Installer as directed by the MANAGER as seaming progresses.

2. All field samples shall be marked with their sample number and seam number. The sample number, date, time, location, and seam number shall be recorded. The Geomembrane Installer shall repair all holes in the geomembrane resulting from obtaining the seam samples. All patches shall be vacuum box tested or spark tested. If a patch cannot be permanently installed over the test location the same day of sample collection, a temporary patch shall be tack welded or hot air welded over the opening until a permanent patch can be affixed.

3. The destructive sample size shall be 300 mm (12 in) wide by 1 m (36 in) long with the seam centered lengthwise. The sample shall be cut into three equal sections and distributed as follows: one section given to the MANAGER as an archive sample; one section given to the MANAGER for laboratory testing as specified in paragraph 5 below; and one section retained by the Geomembrane Installer for field testing as specified in paragraph 4 below.

4. For field testing, the Geomembrane Installer shall cut 10 identical 25 mm (1 in) wide replicate specimens from his sample. The Geomembrane Installer shall test five specimens for seam shear strength and five for peel strength. Peel tests will be performed on both inside and outside weld tracks. To be acceptable, 4 of 5 test specimens must pass the stated criteria in preceding sections with less than 10% separation. If 4 of 5 specimens pass, the sample qualifies for testing by the testing laboratory if required.

5. If independent seam testing is required by the specifications it shall be conducted in accordance with ASTM 5820 or ASTM D4437 or GRI GM 6.

6. Reports of the results of examinations and testing shall be prepared and submitted to the MANAGER.

7. For field seams, if a laboratory test fails, that shall be considered as an indicator of the possible inadequacy of the entire seamed length corresponding to the test sample. Additional destructive test portions shall then be taken by the Geomembrane Installer at locations indicated by the MANAGER; typically 3 m (10 feet) on either side of the failed sample and laboratory seem tests shall be performed. Passing tests shall be an indicator of adequate seams. Failing tests shall be an indicator of non-adequate seams and all seams represented by the destructive test location shall be repaired with a cap-strip extrusion welded to all sides of the capped area. All cap-strip seams shall be non-destructively vacuum box tested until adequacy of the seams is achieved. Cap strip seams exceeding 50 M in length (150 FT) shall be destructively tested.

D. Identification of Defects

1. Panels and seams shall be inspected by the Installer and MANAGER during and after panel deployment to identify all defects, including holes, blisters, undispersed raw materials and signs of contamination by foreign matter.

E. Evaluation of Defects: Each suspect location on the liner (both in geomembrane seam and non-seam areas) shall be non-destructively tested using one of the methods described previously. Each location which fails non-

destructive testing shall be marked, numbered, measured and posted on the daily "installation" drawings and subsequently repaired.

1. If a destructive sample fails the field or laboratory test, the Geomembrane Installer shall repair the seam between the two nearest passed locations on both sides of the failed destructive sample location.
2. Defective seams, tears or holes shall be repaired by reseaming or applying an extrusion welded cap strip.
3. Reseaming may consist of either:
   a. Removing the defective weld area and rewelding the parent material using the original welding equipment; or
   b. Reseaming by extrusion welding along the overlap at the outside seam edge left by the fusion welding process.
4. Blisters, larger holes, and contamination by foreign matter shall be repaired by patches and/or extrusion weld beads as required. Each patch shall extend a minimum of 150 mm (6 in) beyond all edges of the defects.
5. All repairs shall be measured, located and recorded.

F. Verification of Repairs on Seams: Each repair shall be non-destructively tested using either vacuum box or spark testing methods. Tests which pass the non-destructive test shall be taken as an indication of a successful repair. Failed tests shall be reseamed and retested until a passing test results. The number, date, location, technician and test outcome of each patch shall be recorded.

G. Daily Field Installation Reports: At the beginning of each day's work, the Installer shall provide the MANAGER with daily reports for all work accomplished on the previous work day. Reports shall include the following:

1. Total amount and location of geomembrane placed;
2. Total length and location of seams completed, name of technicians doing seaming and welding unit numbers;
3. Drawings of the previous day's installed geomembrane showing panel numbers, seam numbers and locations of non-destructive and destructive testing;
4. Results of pre-qualification test seams;
5. Results of non-destructive testing; and
6. Results of vacuum testing of repairs.

H. Destructive test results shall be reported prior to covering of liner or within 48 hours.

CS 5.3.6 ANCHOR TRENCH

A. Construct as specified on Sheets 9 and 10 of the drawings.
B. The perimeter berm and anchor trench on the south side of the zeolite pad is essentially a mirror image of the perimeter berm shown in Sheet 9.
C. The liner shall be anchor in the trench as shown on Sheet 9 with a minimum depth of two (2) feet and a minimum trench base width of eighteen (18) inches.
D. The liner shall extend a minimum of eighteen (18) inches from the base of the trench on the outer trench wall.
E. The trench backfill shall be compacted by wheel rolling or other suitable method.

CS 5.3.7 PIPE BOOT LOCATIONS AND INSTALLATION

A. Eight (8) inch pipe boots are required at 52 planned locations within the zeolite pad area. As shown on Sheets 22, 23, 24, 40 and others, a total of twelve pipe boots are required for conveyance and spillway pipes between cells for each of the four trains. An additional pipe boot is required for the discharge pipe from Cell #3 of each train.
B. The pipe boots shall be installed to establish the pipe elevations as shown in Sheets 22, 23, 24, 40 and described in CS 8.5.
C. A single eighteen (18) inch pipe boot is required at the emergency spillway location shown on Sheet 29.
D. The pipe boots shall be installed as a conventional single-liner prefabricated or field fabricated pipe penetration boot with stainless steel clamp.

CS 5.3.8 DISPOSAL OF SCRAP MATERIALS

A. On completion of installation, the Geomembrane Installer shall dispose of all trash and scrap material in a location approved by the MANAGER, remove equipment used in connection with the work herein, and shall leave the premises in a neat acceptable manner. No scrap material shall be allowed to remain on the geomembrane surface.

CS 5.4 OUTSLOPE ENVELOPE

HDPE geomembrane is used to create an envelope for the pipe corridor on the LTP outslope as shown on Sheet 31. The geomembrane envelope consists of a continuous length of geomembrane with a width corresponding to the expected roll width of 22 to 23 feet.

A. At the direction of the MANAGER, the Geomembrane Installer shall construct a continuous sheet of geomembrane with a length as directed by the MANAGER and a width corresponding to the roll width of provided HDPE geomembrane. The width of the pipe envelope geomembrane sheet shall not be less than 20 feet. The MANAGER shall designate the location for construction and seaming of the pipe envelope geomembrane sheet.

B. The planned length of the pipe envelope geomembrane sheet is approximately 550 feet. The MANAGER may make adjustments in the required length of the envelope sheet.

C. Excess geomembrane from the zeolite pad liner construction may be used in the pipe envelope geomembrane sheet with approval of the MANAGER.

D. The pipe envelope geomembrane sheet shall be seamed in the same manner as the zeolite pad liner to produce seam shear and tensile strength equivalent to that of the zeolite pad liner.

E. The MANAGER may direct seam testing of the pipe envelope geomembrane sheet to ensure adequate seam strength (see testing requirements in CS 5.3.5).

CS 6 PAD ACCESS ROADS

This section describes the requirements for constructing access road sub-base and base material on top of, and across, the zeolite system pad within the confines of the perimeter berm. In addition, earthen sub-bases for the process tanks, buildings, and miscellaneous areas will also be constructed. Prior to this operation, 60 mil HDPE liner will have been installed over the interior treatment system pad area (CS 5).

CS 6.1 MATERIALS

The construction of the pad access roads and process area sub-base will require the followings materials and products.

A. 6000 sq. ft. of 60 mil HDPE liner for use as a "rub" sheet over the system HDPE liner. This material is identical to that specified in CS 5 above. HMC will procure this material.

B. 1800 feet of used 6 inch HDPE pipe to be located in the HMC pipe yard. This pipe will be used to construct curbs along the zeolite cells. The CONTRACTOR will be responsible for selecting and hauling this material for the pipe yard to the construction site. MANAGER may approve use of other pipe sizes.

C. 1800 linear feet of 10 foot wide geotextile material, or similar material, to use as an anchor for the curb pipe. HMC will procure this material.

D. 500 CY of sandy soil (sub-base) to be salvaged and hauled from the north borrow soil area. The project geotechnical engineer will locate these materials and direct their salvage. The CONTRACTOR will excavate and haul this material to the construction site.

E. 250 CY of -1/2 inch road base basalt crusher fines, if available. HMC will procure the road base material. Alternative road base rock may be procured if basalt crusher fines are not available.

CS 6.2 CONSTRUCTION PROCEDURES

CS 6.2.1 RUB SHEETS

A. HDPE 60 mil liner shall be installed over the entire treatment system prior to this operation (See CS 5). The process area and berm access roads inside the perimeter berm shall be covered with soil and road base material.

B. During construction and prior to placement of the soil, the CONTRACTOR shall lay 60 mil HDPE liner "rub" or "guard" sheets over specified areas of the previously installed liner at the direction of the MANAGER. These areas include selected berms and sections of access roads that will be used for major construction traffic, laborer and equipment access routes within the pad and into cells, high traffic areas, and the general processing area (see Sheet 9 of the drawings). Rub sheets shall also be placed beneath piping or structures which could potentially damage the liner.

C. Liner may be cut and overlapped, as necessary, to ensure coverage of the specified area.

CS 6.2.2 PIPE CURBS

A. In order to prevent cover materials and road base from entering the zeolite cells, the CONTRACTOR will install pipe curbs around the perimeter of all 12 zeolite cells. The location and configuration of the pipe curbs are shown on Sheets 9 and 10 of the drawings.

B. Geotextile material will be laid down length wise along the edge of each cell.

C. Six (6) inch HDPE used pipe will then be laid along the edge of each zeolite cell in the center of the geotextile material. MANAGER may approve installation of differing pipe sizes.

D. The geotextile material will then be folded back over the pipe to the outside of the cell enveloping the pipe inside of the geotextile.

E. The geotextile will then be held in place by soil material. The CONTRACTOR shall ensure that soil does not enter the zeolite cells.

CS 6.2.3 ROAD AND PROCESS AREA SUB-BASE INSTALLATION

A. The CONTRACTOR shall place road sub-base (sandy borrow soil) over the entire area of the treatment system inside the perimeter berm and the pipe curbs.

B. The sub-base material shall not contain angular stones or material which could puncture the liner.

C. The sub-base material shall be placed at a thickness of approximately four (4) inches and rolled and compacted.

D. The CONTRACTOR shall increase the sub-base thickness to approximately six (6) inches in the area of the acid and regeneration tank locations as shown on the drawings. These areas will also be rolled and compacted.

E. The CONTRACTOR shall ensure that the pipe curbs are not moved or disturbed and that the sub-base holds the curbs in place immediately along the edge of each zeolite cell.

F. The MANAGER, at his discretion, may direct additional compaction of the road and process area sub-base.

CS 6.2.4 ROAD BASE INSTALLATION

A. Following completion of the sub-base placement and compaction, the CONTRACTOR shall spread road base material over the entire sub-base material.

B. The road base shall be spread at a thickness of approximately two (2) inches over all sub-base areas.

C. The road base shall be graded, leveled and packed in a manner that ensures the pipe curbs are not disturbed.

CS 7 PVC ASSEMBLY AND INSTALLATION

CS 7.1 GENERAL

Polyvinyl chloride (PVC) pipe is used for transmission and distribution of water within the zeolite pad. PVC piping is also used for transmission of sulfuric acid from the storage tanks to locations in the process buildings and to the regen mixing tanks. The piping and all associated fittings for conveyance of feed water to the zeolite treatment process shall be Schedule 80 PVC. The piping and all associated fittings for the acid transfer system shall be Schedule 80 PVC. With the exception of fittings to connect to the Schedule 80 PVC pipe, the piping for the water distribution system in the base of the zeolite cells shall be SDR 35 PVC DWV or sewer pipe. A small quantity of 1.25 inch diameter Schedule 40 or Schedule 80 PVC pipe is used for plumbing of the pressurized water system in the safety shower and wash building. All PVC pipe shall be solvent cemented.

CS 7.2 PIPE HANDLING AND STORAGE

A. The PVC pipe and fittings shall be transported, handled and stored in a manner which prevents damage, contamination and degradation by excess exposure to sunlight or other environmental effects.
B. If pipe is stored outside for extended periods, MANAGER may require CONTRACTOR to cover pipe with tarps or to relocate pipe to minimize weathering by sunlight.
C. Pipes and fittings shall generally be stored in manufacturer's packaging and on pallets.
D. Pipes stored on top the Large Tailings Pile (LTP) shall be anchored, banded, or sheltered to prevent damage by wind.

CS 7.3 SCHEDULE 80 PVC PIPE CONFIGURATION

The water supply piping configuration includes complex manifold arrangements with multiple components as shown on Sheets 12, 13, 39, 22, 25, 39, and others. The manifold assemblies include solvent weld connections as well as flange connections with butterfly type valves. The PVC piping also connects to HDPE piping at flange connections.

The PVC piping arrangement for the zeolite system consists of two north trains (A and B) and two south trains (C and D) supplied by piping extending from the central

manifold between the two process buildings (see Sheets 11, 12 and 13). The PVC supply piping for the south trains (C and D – see Sheet 15) is essentially a mirror image of the piping for the two north trains (A and B). Additionally, the transfer piping between cells for train B is a mirror image of that for train A shown in Sheets 22 and 40. Transfer piping from cell #1 to cell #2 is shown on Sheet 22 and from cell #2 to cell #3 is shown on Sheet 40.

A. It is strongly recommended that the CONTRACTOR create "mock" assemblies of the more complex manifolds and subassemblies before cementing the joints on the assemblies.
B. CONTRACTOR shall assemble the PVC fittings in manifolds and supply and transfer piping in a manner which provides a leak-free water transmission system.
C. CONTRACTOR shall install valves so that the valve can function from fully open to fully closed with no binding or leakage.

CS 7.4 SCHEDULE 80 PVC PIPE AND FITTINGS ASSEMBLY

A. All pipe and fittings for assembly shall be clean and free of debris.
B. If there are burrs or shavings on a cut pipe edge at a joint, the edge shall be filed, scraped or beveled prior to assembly.
C. Pipe manufacturer's recommended primer and cement shall be used.
D. Primer and cement shall be applied with separate applicators of appropriate design.
E. Primer shall be uniformly applied over the entire insertion length and area on both the spigot and bell/socket ends of the joint.
F. If the bonding surface is contaminated, the contamination shall be scraped off after initial primer application, and additional primer shall be applied in the affected area. If contamination cannot be removed, the pipe or fitting shall be replaced.
G. Cement shall be uniformly applied over the entire insertion length and area on both the spigot and bell/socket ends of the joint as soon as possible after primer application and while the primer is still wet.
H. The cement shall be applied in a thick layer to prevent immediate drying.
I. Sufficient cement shall be applied to fill all voids in the joint and to produce a bead of cement around the pipe after insertion.
J. The pipe shall be inserted to the full joint length as quickly as possible after glue application.

CS 7.5 SDR35 PVC PIPE CONFIGURATION

The water distribution piping configuration includes distribution manifolds as shown on Sheets 17, 18, 19 and others. The distribution manifolds are primarily constructed with perforated SDR35 DWV or sewer pipe and these manifolds are covered with gravel to distribute the feed water to the cells over the entire base of each cell. Vertical DWV gas vent risers extend from Tees in the horizontal DWV distribution piping. The DWV pipe is connected to the PVC Schedule 80 supply piping at the western end of each cell. The DWV pipe is also connected to a 12" HDPE pump access pipe at two locations in each cell. Additionally, the DWV pipe is connected to a PVC Schedule 80 pipe that functions as a contingency pump access pipe.

The DWV distribution piping arrangement for the zeolite system consists of two north trains (A and B) and two south trains (C and D) supplied by water supply piping at the west end of each cell (see Sheets 17, 18 and 19). The DWV manifold arrangement of train B is a mirror image of the arrangement for train A. The DWV manifold piping for the south trains (C and D – see Sheet 19) is a mirror image of the piping for the two north trains (A and B).

A. CONTRACTOR shall assembly the DWV pipe fittings in manifolds in a manner which prevents displacement or damage of the piping during construction and during placement of gravel and zeolite in the cells.

CS 7.6 SDR35 PIPE AND FITTINGS ASSEMBLY

A. All pipe and fittings for assembly shall be clean and free of debris.
B. If there are burrs or shavings on a cut pipe edge at a joint, the edge shall be filed, scraped or beveled prior to assembly.
C. Pipe manufacturer's recommended primer and cement shall be used.
D. Primer and cement shall be applied with separate applicators of appropriate design.
E. Primer shall be uniformly applied over the entire insertion length and area on both the spigot and bell/socket ends of the joint.
F. If the bonding surface is contaminated, the contamination shall be scraped off after initial primer application, and additional primer shall be applied in the affected area.
G. Cement shall be uniformly applied over the entire insertion length and area on both the spigot and bell/socket ends of the joint as soon as possible after primer application and while the primer is still wet.
H. The cement shall be applied in a thick layer to prevent immediate drying.
I. Sufficient cement shall be applied to fill all voids in the joint and to produce a bead of cement around the pipe after insertion.

J. The pipe shall be inserted to the full joint length as quickly as possible after glue application and the pipes shall be oriented such that the perforations are on the sides of the pipe.

CS 7.6.1 SPECIALTY CONNECTIONS AND GAS VENTS

Specialty connections are required at transitions from the Schedule 80 PVC supply to the DWV piping, at transitions to the contingency pump access pipes, and at the connection to the sump access pipe. Numerous vertical DWV pipe gas vents are also included in the distribution piping manifold. Atrium grates are also installed in the PVC discharge pipe from each cell.

CS 7.6.1.1 Water Supply Transitions

Feed water is supplied to the DWV distribution manifold at the west end of each cell.

A. The water supply to DWV transition for cell #1 shall be constructed as shown on Sheet 24 for train A and on Sheet 39 for train B. The water supply to DWV transitions for cells #1 in trains C and D is a mirror image of that for trains A and B.
B. For cell #1 in each of the four trains, the Schedule 80 PVC water supply pipe shall extend down the 1H:1V cell slope to a Schedule 80 PVC Tee at the base of the cell as shown in Sheet 24.
C. The water supply to DWV transition for cells #2 and cells #3 shall be constructed as shown on Sheets 22 and 40, respectively, for train A. The water supply to DWV transitions for cells #2 and cells #3 in trains B, C, and D is very similar to that for train A with only minor differences in the water supply manifold configuration resulting from the mirror image arrangement described previously.
D. The water supply piping in cells #2 and #3 shall extend horizontally across the surface of the zeolite to a point directly above the western header manifold of the DWV distribution piping as show in Sheets 22 and 40.
E. The water supply piping in cells #2 and #3 shall be connected to the DWV distribution header manifold through a vertical pipe and Tee arrangement as shown in Sheets 22 and 40
F. Schedule 80 PVC to SDR35 DWV pipe adaptors shall be used to connect the water supply pipe to the perforated DWV manifold.

CS 7.6.1.2 Contingency Pump Access Pipe

A pipe connected to the DWV distribution manifold is extended to the top of the berm in each cell as a contingency for pumping access to the distribution piping.

A. The typical DWV to Schedule 80 PVC transition for contingency pump access shall be constructed as shown on Sheet 24.
B. Schedule 80 PVC to SDR35 DWV pipe adaptors shall be used to connect the pump access pipe to the perforated DWV manifold.

CS 7.6.1.3 Sump Access Connections

The DWV distribution piping is connected to the twelve-inch HDPE regen pump access pipe at two locations in each cell as shown on Sheets 18, 19 and 26.

A. At least two of the DWV distribution laterals cross the regen pump access pipe in each cell as shown in Sheets 18 and 19. The locations for the connections from the DWV laterals to the HDPE pipe are indicated by rectangles (representing pipe Tees) on the laterals directly over the HDPE access pipe.
B. The DWV laterals shall be connected to the HDPE access pipe by:
    1) Drilling or cutting a hole slightly larger than the outer diameter of the DWV pipe Tee in the top of HDPE pipe at the location of the lateral crossing. The hole shall be sized to allow insertion of the pipe Tee with no more than 0.5 inch of opening around the DWV pipe Tee (see Sheet 26).
    2) The leg on the DWV pipe Tee shall be trimmed such that the protrusion into the HDPE pipe is no more than three (3) inches from the top of the HDPE pipe.
    3) The DWV pipe Tee shall be installed in the lateral and inserted into the HDPE regen pump access pipe.
    4) The DWV pipe shall be secured to the HDPE access pipe by a stainless steel (or other acid resistant material) strap and stainless steel lag screws.

CS 7.6.1.4 Gas Vent Installation

Vertical DWV pipe gas vents shall be installed at numerous locations in each of the cells. The location of the gas vents are indicated as circle within a rectangle (representing a pipe Tee) on Sheets 17 through 21. Gas vents are located along the DWV header manifold on the west end of each cell, and in three rows of vents along the west to east distribution pipes in each cell as shown on Sheets 18 through 21. A typical gas vent installation is shown on Sheet 26.

A. The DWV gas vents shall be solid SDR35 DWV or sewer pipe with no perforations.
B. The DWV gas vents shall be fully inserted and cemented into the DWV Tee along the horizontal DWV distribution pipe as shown on Sheet 26.

C. The DWV gas vents shall extend no less than three feet above the final zeolite surface.
D. A DWV cap with a 0.5 inch or larger hole shall be placed on the DWV pipe prior to addition of the zeolite to the cells.
E. The vertical DWV pipes shall be supported as necessary to maintain the vertical orientation and prevent damage during cell construction.

CS 7.6.1.5 Atrium Grate and Discharge Pipe Cap Installation

A. Plastic atrium grates shall be installed at uniform intervals along the eight (8) inch Schedule 80 PVC discharge pipes in each cell as shown on Sheets 15, 16, 22 and others.
B. A minimum of fourteen (14) atrium grates shall be installed in the discharge pipe in each cell.
C. The atrium grates shall be three (3) inch diameter or greater.
D. The grates shall be installed in holes drilled through the top of the eight (8) inch discharge pipe and shall be secured to the pipe with stainless steel screws.
E. A PVC pipe cap shall be installed on the western end of the eight (8) inch discharge pipe in each cell.
F. The PVC pipe cap shall be perforated by drilling a minimum of fifteen (15) 0.5 inch diameter holes distributed over the surface of the cap.

CS 7.7 PIPE COVERAGE

A. Sections of the exposed PVC piping shall be covered with soil as directed by the MANAGER to anchor, protect and provide frost protection for piping.
B. The areas and depth of coverage will be at the direction of the MANAGER.
C. The soil coverage shall <u>not</u> interfere with water conveyance or valve operation.
D. Soils selected for pipe coverage shall generally be granular and can be mounded over the designated pipe corridors.
E. Soils shall <u>not</u> be compacted unless directed by MANAGER.

CS 8 HDPE PIPE ASSEMBLY AND INSTALLATION

CS 8.1 GENERAL

HDPE pipe is used for transmission of water to and from the zeolite system and also for portions of the water conveyance system within the cells. HDPE pipe is also used for conveyance of zeolite regeneration (regen) fluids to the evaporation or collection ponds. HDPE pipe and fittings for the zeolite system shall be supplied by HMC and will be delivered to the general project area.

CS 8.2 PIPE HANDLING AND STORAGE

A. The HDPE pipe and fittings shall be transported, handled and stored in a manner which prevents abrasion, damage and contamination.
B. All new pipes and fittings shall generally be stored in manufacturer's packaging until needed.
C. All pipes and fittings shall be transported by methods that will prevent crimping or excessive bending.

CS 8.3 HDPE PIPE CONFIGURATION

The water supply piping configuration includes long transmission lines and complex manifold arrangements with multiple components as shown on Sheets 1, 2, 25, 33, 34 and others. The manifold assemblies include flange connections with butterfly type valves. The HDPE piping also connects to PVC piping at flange connections within the zeolite pad area.

HDPE pipe is used to convey the feed water for the zeolite system from the booster station manifold (see Sheet 33) to the western side of the zeolite pad. HDPE water supply piping at the zeolite pad consists primarily of a central manifold between the two process buildings as shown in Sheet 25. Within the zeolite pad area, HDPE pipe is used for conveyance of water between cells as shown in Sheets 22 and 39. HDPE pipe is used to convey the treated water discharged from the eastern end of the zeolite cells to a treated water manifold shown on Sheet 33. The HDPE piping also includes additional pipelines to convey regen water from the zeolite system to the evaporation or collection ponds, to convey feed water to the RO plant and to convey treated water to injection wells. These conveyance pipelines are generally routed in a common corridor as shown in Sheets 34 through 38.

A. It is strongly recommended that the CONTRACTOR create "mock" assemblies of the more complex manifolds and subassemblies before fusing the pipe assembly components.

B. CONTRACTOR shall assembly the HDPE fittings in manifolds and supply and transfer piping in a manner which provides a leak-free water transmission system.
C. CONTRACTOR shall install valves so that the valve can function from fully open to fully closed with no binding or leakage.

CS 8.4 HDPE PIPE AND FITTINGS ASSEMBLY

A. Pipe and fittings shall be inspected prior to assembly to insure there is no contamination or debris that would compromise fusion or assembly.
B. Each operator performing fusion joining shall be qualified in the use of the manufacturer's recommended fusion procedure(s).
C. Sections of polyethylene pipe shall be joined into continuous lengths on the job site above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures shall be capable of meeting all conditions recommended by the pipe manufacturer.
D. Butt fusion joining shall result in joint weld strength equal to or greater than the tensile strength of the pipe. Socket fusion shall <u>not</u> be used. Extrusion welding or hot gas welding of HDPE shall <u>not</u> be used.

CS 8.4.1 HEAT FUSION

Use fusion equipment specially designed for heat fusion of HDPE. The equipment utilized shall be regulated for the different melt strength materials. Compatibility fusion techniques shall be used when polyethylene of different melt indexes are fused together.

Use the following procedure to butt fused HDPE pipe. If a procedure noted below contradicts manufacturer's recommendations, follow the manufacturer's recommendation.

A. Maintain the proper temperature of the heater plate as recommended by the pipe manufacturer. Check it with a tempilstik or pyrometer for correct surface temperature.
B. Clean pipe ends inside and outside with a clean cotton cloth to remove dirt, water, grease, and other foreign materials.
C. Square (face) the pipe ends using the facing tools on the fusion machine. Remove all burrs, chips, and filings before joining pipe or fittings.
D. Check the line-up of pipe ends in the fusion machine to see that pipe ends meet squarely and completely over the entire surface to be fused. The clamps shall be tight so that the pipe does not slip during the fusion process.

E. Insert the clean heater plate between the aligned ends and bring the ends firmly in contact with the plate but do not apply pressure while achieving the melt pattern. Allow the pipe ends to heat and soften. Softening depths shall be per the manufacturer's recommendation.
F. Carefully move the pipe ends away from the heater plate and remove the plate (if the softened material sticks to the heater plate, discontinue the joint, clean heater plate, square pipe ends, and start over).
G. The melted ends shall be connected rapidly but not slammed together. Apply enough pressure to form a double rollback bead to the body of the pipe around the entire circumference of the pipe about 1/8-inch (3.175-mm) to 3/16-inch (4.763-mm) wide. Pressure is necessary to cause the heated material to flow together.
H. Allow the joint to cool and solidify properly. Remove the pipe from the clamps and inspect the joint appearance.

CS 8.5 PIPE BOOT LOCATIONS AND ELEVATIONS

A. CONTRACTOR shall install HDPE conveyance and spillway pipes between cells as shown on Sheets 22, 23, 24 and 40.
B. Three eight (8) inch HDPE pipes shall be trenched or installed through the berm between Cell #1 and Cell #2 for each train (see Sheets 22 and 23). Each pipe will be booted through the liner on the east end of Cell #1 and on the west end of Cell #2. The elevation of the lower pipe invert at the boot location for the three pipes shall be as follows:
    a. East end of Cell #1 – two conveyance pipes with lower pipe invert elevations of 6671.7 to 6671.9 feet above mean sea level (MSL).
    b. East end of Cell #1 – one spillway pipe with lower pipe invert elevation of 6673.2 to 6673.4 feet above MSL.
    c. West end of Cell #2 – two conveyance pipes with lower pipe invert elevations of 6669.5 to 6669.7 feet above MSL.
    d. West end of Cell #2 – one spillway pipe with lower pipe invert elevation of 6670.0 to 6670.3 feet above MSL.
    e. The pipe boot elevations will apply for all four trains.
C. Three eight (8) inch HDPE pipes shall be trenched or installed through the berm between Cell #2 and Cell #3 for each train (see Sheets 23 and 40). Each pipe will be booted through the liner on the east end of Cell #2 and on the west end of Cell #3. The elevation of the lower pipe invert at the boot location for the three pipes shall be as follows:
    a. East end of Cell #2 – two conveyance pipes with lower pipe invert elevations of 6668.9 to 6669.1 feet above mean sea level MSL.

b. East end of Cell #2 – one spillway pipe with lower pipe invert elevation of 6670.3 to 6670.5 feet above MSL.
c. West end of Cell #3 – two conveyance pipes with lower pipe invert elevations of 6666.6 to 6666.8 feet above MSL.
d. West end of Cell #3 – one spillway pipe with lower pipe invert elevation of 6667.2 to 6667.5 feet above MSL.
e. The pipe boot elevations will apply for all four trains.

D. One eight (8) inch HDPE pipe shall be trenched or installed through the berm on the west end of Cell #3 for each of the four trains (see Sheets 24). The discharge pipe will be booted through the liner on the west end of Cell #3 with the lower pipe invert at the boot location as follows:
   a. East end of Cell #3 – discharge pipe with lower pipe invert elevation of 6666.3 to 6666.5 feet above MSL.

E. The pipe corridors or trenches shall be backfilled to produce a dense fill around the conveyance, discharge and spillway pipes.

F. The HDPE pipes at the boot locations shall extend five (5) or more feet into the cell to allow fusion to the pipe.

CS 8.6 PIPE CORRIDOR TRENCH INSTALLATION

A. CONTRACTOR shall inspect the pipe corridor, and in consultation with the MANAGER, identify all pipes, utilities, electrical service, well control lines, well locations, road crossings and other features that are within the corridor disturbance area, cross the pipeline corridor, or may otherwise interfere with the pipeline corridor construction.

B. CONTRACTOR shall, in consultation with the MANAGER, develop a plan for avoidance, relocation, temporary suspension of operation, or replacement of features (e.g. pipelines, electrical service, roads etc.) that interfere with corridor construction.

C. Buried or covered HDPE piping within the corridor extending from the toe of the LTP to the booster station and/or treated water manifolds (see Sheets 34 through 38 and Sheet 41) shall be installed in a manner which provides a dense fill around the pipes and prevents crushing or displacement of the pipes.

D. If sections of the trench base are soft, cannot be adequately graded, or contain unsuitable materials such as large angular rock, the material in the base of the trench shall be removed and replaced with dry granular bedding material as shown in Sheet 41.

E. The pipes shall be positioned in the trench such that minimum distances as shown in Sheet 41 are maintained or exceeded. If necessary, the trench shall be widened to accommodate the pipes with minimum clearances.

F. Dry granular fill shall be placed as haunching fill as shown on Sheet 41. The material shall be placed to produce a dense fill with no voids around the pipe. Small compaction equipment may be used.
G. The pipes shall not be crushed, crimped or damaged during the installation and backfill of the trench.
H. Initial and final backfill shall be placed to produce a dense fill within the pipe corridor. Small compaction equipment or vehicle/equipment traffic may be used.

CS 8.7 PIPE COVERAGE

This section describes soil coverage of HDPE pipes in areas where excavation or trenching is disallowed or limited, and this generally includes the area of the footprint of the large tailings pile. Soil coverage shall be used at the direction of the MANAGER for section of the piping extending from the toe of the LTP in the general area of the southern end of the pipe outslope envelope shown in Sheet 32 to the zeolite pad area.

A. Sections of the exposed HDPE piping within the zeolite pad area, on the top of the LTP, and near the toe of the LTP shall be covered with soil as directed by the MANAGER to anchor, protect and provide frost protection for piping.
B. The scheduling, areas, and depth of coverage will be at the direction of the MANAGER.
C. The soil coverage shall not interfere with system testing, water conveyance or valve operation.
D. Soils selected for pipe coverage shall generally be granular and can be mounded over the designated pipe corridors.
E. Compaction of soil cover over pipes shall be at the direction of MANAGER.
F. The sections of HDPE water supply piping and regen piping extending from the anchor block at the crest of the LTP (see Sheet 31) to the point where pipes enter the lined containment on the western perimeter berm (see Sheets 11 and 42) shall be covered with soil at the direction of MANAGER.
G. The sections of HDPE discharge piping extending from the anchor block at the crest of the LTP (see Sheet 31) to the Wye strainer location (see Sheet 41) shall be covered with soil at the direction of MANAGER.
H. The sections of HDPE discharge piping extending from the Wye strainer location (see Sheet 41) along the discharge pipe bench (see Sheet 11) shall be covered with soil at the direction of MANAGER.
I. Soil coverage of the pipes at designated road crossings, pad access berms or ramps, and other crossing locations as designated by MANAGER, shall be placed at a density and thickness sufficient to prevent crushing or displacement of the pipes by traffic.

CS 8.8 OUTSLOPE PIPE ENVELOPE

This section describes the construction of the pipe envelope on the outslope of the LTP as shown on Sheet 31. The pipe envelope geomembrane sheet shall be constructed as described in CS 5.4.

A. The section of HDPE piping extending from the crest of the LTP to the toe of the LTP shall be encased in a pipe envelope geomembrane sheet as shown on Sheet 31.

B. The pipe envelope corrider shall be prepared by the placement of a fine granular material bedding layer (see Sheet 31) of sufficient thickness and area to allow safe working conditions on the LTP outslope. The bedding layer shall have sufficient thickness and area to allow the deployment of the pipe envelope geomembrane sheet without damage to the sheet.

C. The pipe envelope geomembrane sheet shall be deployed in a safe and controllable manner. CONTRACTOR shall consult with MANAGER on procedures for handling and deployment of the pipe envelope geomembrane sheet.

D. The pipe envelope geomembrane sheet shall be anchored at the crest of the LTP as shown on Sheet 31.

E. The pipelines shall be installed in a manner that does not damage the pipe envelope geomembrane sheet.

F. After installation of the pipes, the pipe envelope geomembrane sheet shall be wrapped around the pipes and the seam clamps installed as shown on Sheet 31.

CS 9 PUMP INSTALLATION

CS 9.1 GENERAL

Pumps are required for transfer of acid to the regeneration tanks, injection of acid into the zeolite supply water, evacuation of water from the individual zeolite cells and pressurization of water supply for the emergency shower and wash system. Vertical centrifugal pumps are also required at the supply manifold near the RO plant.

CS 9.2 PUMP INSTALLATION

A. All pumps shall be installed according to the relevant pump manufacturer's instructions and recommendations.

B. Power supply and pump control systems shall be installed by a qualified electrician and shall conform to all applicable electrical codes.

CS 9.3 REQUIRED PUMPS

A. The acid transfer pump shall be a Finish Thompson Inc. (fti) DB6V series with three (3) inch impellor or equivalent.

B. The four (4) acid injection pumps shall be a Blue-White Chem-Pro® C2 ProSeries Diaphragm Pump or equivalent. Two pumps shall be installed in each of the Process buildings located on the zeolite pad.

C. The twelve (12) submersible cell evacuation pumps shall be a stainless steel Grundfos® 300S75-2 or equivalent. One pump will be installed in each of the cell access pipes shown on Sheet 17 and others.

D. The emergency shower and building supply pump shall be a Flint & Walling Model VP10 or equivalent. The pump will be installed in the shower/wash building shown on Sheet 27.

E. The small water supply booster pump shall be a Goulds A-C 1500 6x6x7 - 1750 rpm, 6.75" impeller or equivalent.

D. The large water supply booster pump shall be a Goulds A-C 1500 6x6x9½ - 1750 rpm, 8.5" impeller or equivalent.

CS 10 GRAVEL PLACEMENT

This section consists of the requirements of the delivery and placement of 1080 CY of washed gravel in the zeolite beds. The washed gravel will be utilized as a cover for the water distribution manifolds and to distribute the water evenly throughout each zeolite cell.

CS 10.1 GRAVEL

A. The gravel to be used on this project to bury the water distribution manifold in each zeolite cell shall consist of one (1) inch minus washed rounded river rock gravel.

B. Approximately 1080 CY of gravel will be required to complete the project. Additional gravel volume may be required to offset typical stockpile and handling loss.

C. The gravel must be washed prior to delivery to remove fines from the material.

D. Angular crushed rock, including limestone, is unacceptable for this project.

E. HMC will procure the gravel and have it delivered to the site. The MANAGER, or his representative, will approve each load for size and quality.

F. The CONTRACTOR will select a location for storage of the gravel and direct the trucks to this site.

G. CONTRACTOR will be responsible for pushing and stockpiling the gravel and at all times shall keep soil or fines from contaminating the material.

CS 10.2 PROCEDURES

CS 10.2.1 GRAVEL LOCATION AND SEQUENCING

A. The gravel will be placed on top of the water distribution manifolds located in the bottom of each zeolite cell. The locations of the distribution manifolds are shown on Sheets 17 through 21.

B. The CONTRACTOR will begin placing washed gravel in each zeolite cell immediately following completion of the access roads across the zeolite pad and

the completion of the installation of each water distribution manifold located on the floor of each zeolite cell.

C. Each cell will require one (1) foot thickness of washed gravel to cover the manifolds as shown on Sheet 26. All gravel will be leveled across each cell. Note that gravel must also extend with tapering thickness up the cell access ramp, again shown on sheet 26.

CS 10.2.2 PLACEMENT

A. Each cell requires one (1) foot thickness of gravel placed in the bottom of each cell after the water distribution manifolds are in place.

B. The CONTRACTOR will determine the best option and equipment to install the gravel. Any placement method employed by the CONTRACTOR must be approved by the MANAGER prior to beginning this operation.

C. The method employed must not damage the liner, inside or outside of each cell, and must not damage or move the pipe curbs used to keep access road material from entering each cell. It is recommended, but not required, that a method that swings the gravel over the placement location, such as a crane, be utilized.

D. Should the placement of gravel damage the liner in a cell, placement must stop immediately until the liner has been repaired. The MANAGER will approve the repair prior to proceeding with additional gravel placement.

E. Once the gravel has been placed in the bottom of each cell, the CONTRACTOR will be required to level the gravel across the cell. This will need to be accomplished with hand labor and shovels.

F. The CONTRACTOR shall <u>not</u>, under any circumstance, damage the liner with shovel points or by other means. If a tear in the liner occurs, CONTRACTOR shall stop work in the area immediately and repair the liner material.

G. The MANAGER must approve any liner repairs prior to proceeding with further gravel placement or leveling operations.

CS 11 ZEOLITE PLACEMENT

This section describes the requirements for storage and placement of zeolite in each cell. HMC will procure the zeolite and have it delivered to the site via flatbed tractor-trailers.

CS 11.1 ZEOLITE MATERIAL AND CHARACTERISTICS

The zeolite to be used on the project originates from St. Cloud Mining Company located near Winston, New Mexico. The material is a microporous volcanic mineral that is mined and crushed to required specifications. Zeolite Technical Information, including a MSDS, is included in Appendix B. The zeolite will have the following general characteristics:

A. Particle Size – 14 X 40 mesh screen size

B. Bulk Density – 50 – 54 lbs/ft^3

C. pH – 7.5 to 8.0

D. Environmental Properties – Inert; non-toxic; classified as Generally Regarded as Safe (GRAS); No fibrous silicates; Dust masks should be worn when handling.

CS 11.2 ZEOLITE DELIVERY AND STORAGE

A. Approximately 4800 tons of zeolite shall be delivered to the site via flatbed semi tractor-trailer rigs. It will be packaged in super-sack quantities with each truck delivering 25 tons/load or slightly less. The MANAGER may have additional tonnage delivered to ensure appropriate zeolite elevations in each cell.

B. The super sacks will be placed on wooden pallets for easy off-loading and each super-sack will hold 2200 pounds of 14 X 40 mesh zeolite. It is anticipated that approximately 210 to 220 loads (4300 to 4400 super-sacks) of zeolite will be required to complete the project.

C. All trucks arriving at the gate shall be escorted to the storage area. Traffic routes are shown on Sheet 3. The off-loading and storage area is shown on Sheet 5.

D. The CONTRACTOR shall be required to off-load all trucks and place the zeolite in the designated storage area. It is permissible to stack the zeolite sacks two bags high as necessary to save storage space.

E. It is recommended that the CONTRACTOR utilize a telehandler (telescoping forklift) for off-load efficiency.

CS 11.3 ZEOLITE SEQUENCING

A. The CONTRACTOR will initiate zeolite placement immediately after the installation of gravel in each zeolite cell as detailed in CS 10.

B. Zeolite staging and placement should be accomplished at a rate of approximately one zeolite cell per day to maintain tight schedule constraints.

CS 11.4 ZEOLITE PLACEMENT

A. The CONTRACTOR shall place 400 tons of zeolite in each of the 12 zeolite treatment cells. Zeolite shall be evenly placed in each cell to the elevations as shown on the drawings. The MANAGER, at his discretion, may direct placement of additional zeolite in a cell to ensure the top surface of the zeolite is at the planned elevation.

B. Zeolite shall be placed using a crane to lift and swing the zeolite in place. The CONTRACTOR shall ensure that the crane operator is OSHA certified and will provide the MANAGER verification of this certification.

C. The crane shall be sized by reach and by weight handling capacity to ensure that it can reach across cells without the need to frequently move the crane and can lift and swing the super-sacks without risk of overturning the crane.

D. Safety is of utmost necessity and the CONTRACTOR is required to have safety personnel monitoring the process and directing safe practices at all times during this operations.

E. The crane must have operable out-riggers that must be activated and extended prior to swinging super-sacks of zeolite into the cells. The crane must be positioned so that out-riggers, when extended, do not damage the liner or the edge of the cells. Blocking under the out-riggers is required so that they do not damage the liner.

F. MANAGER may suspend zeolite placement operations if safe operating conditions are not maintained.

G. Alternative zeolite placement options or equipment may be utilized, but must be approved by the MANAGER.

H. The CONTRACTOR shall stage zeolite near the crane at a rate that maintains a steady placement schedule. The methods or equipment to accomplish this are at the discretion of the CONTRACTOR but must be approved but the MANAGER. It is recommended, but not required, that telehandler(s) be utilized for this task.

I. Laborers shall attach chokers to the "ears" of the zeolite super-sacks. The crane shall swing its cable into place and the chokers shall be attached to the cable clevis. The crane shall then lift and swing the super-sack into place in the cell and lower it to approximately 2 feet above the gravel or zeolite. A laborer will then approach the super-sack, reach underneath, and cut the sack with a razor knife to allow the sack to empty. If functional, the razor knife can be attached to an extended handle to allow the laborer to cut the sack from a distance of several feet. Laborers must wear dust masks at all times during this operation.

J. AT NO TIME SHALL A LABORER OR OTHER PERSONNEL STAND UNDERNEATH A SUPER-SACK AS IT IS BEING LIFTED, SWUNG, OR LOWERED.

K. Following placement of the 400 tons of zeolite in each cell, the CONTRACTOR shall ensure that the zeolite is leveled across each cell at the same elevation. This will likely require hand labor and shovels. Laborers must wear dust masks at all times while shoveling zeolite. The CONTRACTOR must ensure that shovels do not cause tears in the liner material and must immediately repair any tears to liners.

L. The CONTRACTOR must properly dispose of or store the cut super-sacks in a dumpster or other suitable container immediately after removal from the crane.

M. The MANAGER will approve the final elevations of the zeolite placement.

CS 12 CONCRETE WORK

CS 12.1 GENERAL

Reinforced cast-in-place concrete is used in constructing support pads for the two acid tanks and the four regeneration tanks located on the zeolite pad. A mesh reinforced cast-in-place concrete block is used as an anchor block for the conveyance pipes at the crest of the Large Tailings Pile (LTP). A mesh reinforced cast-in-place concrete pad is used for the foundation of each of the two small manifold buildings near the RO plant.

CS 12.2 CONCRETE

CS 12.2.1 SUBMITTALS

A. Concrete

CONTRACTOR shall submit *before use of cast-in-place concrete,* design mixes and laboratory test reports indicating that the concrete ingredients and proportions will result in concrete mixes meeting requirements specified.

B. Batch Tickets

CONTRACTOR shall submit, *with each batch delivered*, delivery tickets from the concrete supplier setting forth the following information:

1. Name of Supplier
2. Name of batching plant and location
3. Date
4. Serial number of ticket
5. Truck number and batch number
6. Contract number and location
7. Volume of concrete (cubic yards)
8. Maximum size of aggregate
9. Type and brand of cement
10. Weight of cement
11. Maximum size of aggregate
12. Weights of fine and coarse aggregates
13. Types and amounts of admixtures
14. Projected Slump

4. The 7-day and 28-day tests shall be performed in accordance with ASTM C 39.

C. The MANAGER may require concrete slump and air voids testing for the purpose of quality control. At the direction of the MANAGER, the CONTRACTOR or a third party approved by the MANAGER shall perform the testing as follows:

1. Perform concrete slump test in accordance with ASTM C143. The concrete may be rejected by the MANAGER if the sample(s) exhibit a collapse or shear failure or if the slump exceeds four (4) inches.
2. Perform concrete air content test in accordance with ASTM C231. The concrete may be rejected by the MANAGER if the air content in the sample(s) does not meet the specified air content.

CS 12.2.2.1 Reference Standards (Latest Edition)

1. ACI 211 Recommended Practice for Selecting Proportions for Normal Weight Concrete
2. ACI 301 Structural Concrete for Buildings
3. ACI 302 Guide for Concrete Floor and Slab Construction
4. ACI 304 Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete
5. ACI 305 Recommended Practice for Hot Weather Concreting
6. ACI 306 Recommended Practice for Cold Weather Concreting
7. ASTM C 31 Standard Method of Making and Curing Concrete Test Specimens in the Field
8. ASTM C 33 Specification for Concrete Aggregates
9. ASTM C 39 Test for Compressive Strength of Cylindrical Concrete Specimens
10. ASTM C 94 Specification for Ready-Mixed Concrete
11. ASTM C 150 Specification for Portland Cement
12. ASTM C 172 Sampling Fresh Concrete
13. ASTM C 494 Specification for Chemical Admixtures for Concrete

CS 12.2.3 CONCRETE MIXES

A. Acid Tank and Regeneration Tank Slabs

Concrete for the Acid and Regeneration Tank slabs shall have a minimum compressive strength of 4,000 psi in 28 days. The concrete shall be

proportioned in accordance with ACI 211. The type of cement used shall be Portland, Type II (ASTM C150). Air entrainment shall be furnished in all concrete. Air content shall be 5% ± 1%.

B. Pipe Anchor Block and Building Foundations

Concrete for the pipe anchor block and the two manifold building foundations slabs shall have a minimum compressive strength of 3,000 psi in 28 days. The concrete shall be proportioned in accordance with ACI 211. The type of cement used shall be Portland, Type II (ASTM C150). Air entrainment shall be furnished in all concrete. Air content shall be 5% ± 1%.

CS 12.2.4 CONCRETE PLACEMENT

A. Notify MANAGER a minimum two (2) working days prior to commencement of concrete placement operations.

B. Place concrete in accordance with ACI 301.

C. Hot Weather Placement:

1. When hot weather conditions exist that would seriously impair the quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

2. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90°F. Mixing water may be chilled or chopped ice may be used to control the concrete temperature provided the water equivalent of the ice is calculated to the total amount of mixing water.

3. Cover reinforcing steel with water-soaked burlap if it becomes too hot so that the steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

4. Wet forms and grade thoroughly before placing concrete.

5. Evaporation retardant shall be approved by the MANAGER on a pour by pour basis. This is to be used per manufacturer's recommendations. This is not to be used as a finishing agent.

D. Cold Weather Placement

1. Protect concrete from physical damage or reduced strength caused by frost, freezing, or low temperatures, in compliance with ACI 306 and as herein specified.

2. If necessary to place concrete when ambient air temperature is below 40°F or expected to fall below 40°F during cure period, placement shall be approved by the MANAGER. Work shall be placed and protected in accordance with Table 7.3.3 of ACI 306 until concrete has reached 3,500 psi as evidenced by cylinders field cured in accordance with ASTM C31. MANAGER may require protection plan in writing.

3. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen material.

4. Do not use calcium chloride, salt and other material containing antifreeze agents, or chemical accelerators, unless otherwise accepted in writing by the MANAGER.

CS 12.2.4.1 Finishing and Anchors

A. As defined in ACI 301.

B. Do not add water to concrete surface (i.e. sprinkle) without written approval from the MANAGER.

C. All concrete surfaces shall be leveled and finished with a broom finish.

D. Anchors or anchor bolts shall be cast-in-place for the tank support slabs, anchor block, and building foundations. Commercial or tank manufacturer supplied concrete anchors shall be embedded in the concrete to recommended depth or as directed by the MANAGER. MANAGER may require that anchors be attached to concrete reinforcement or anchor plates.

CS 12.3 REINFORCEMENT

Concrete reinforcement is used in construction of tank support slabs, the pipe anchor block, and the two building foundations. Placement of concrete reinforcement shall be as shown on the Drawings or as directed herein.

CS 12.3.1 REFERENCE STANDARDS

1. ACI 318 Building Code Requirements for Reinforced Concrete

2. ASTM A 615 Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

CS 12.3.2 PRODUCTS/MATERIALS

A. Reinforcing steel bars shall be made from plain or deformed new billet stock and shall conform to ASTM A 615, Grade 60.

B. Reinforcement steel mesh shall be Grade 40 or better and shall have a minimum bar diameter of 0.20 inches or greater. Reinforcement mesh shall have a grid (bar) spacing of not more than six (6) inches.

C. Reinforcement chairs, hangers, spacers, or other supports shall be non-corrosive.

D. All reinforcement shall be free from oil, mill scale and excessive rust, or other coatings that will destroy or reduce bond.

CS 12.3.3 PLACEMENT OF REINFORCEMENT

A. Acid Tank and Regeneration Tank Slabs

1. Bars shall be spaced and positioned as shown on the Drawings.

2. All bars shall be bent cold and shall <u>not</u> be straightened in a manner which will injure the material.

3. Three (3) inches of concrete cover shall be provided for main reinforcement.

3. Reinforcement shall be spliced and tied in accordance with the requirements of ACI 318, and/or as shown in the Drawings.

B. Pipe Anchor Block and Building Foundations

1. Reinforcement mesh shall be placed and supported at a height of two (2) inches or more above ground level for a concrete thickness of six (6) inches or less. Reinforcement mesh shall be placed and supported at a height of three (3) inches or more above ground level for a concrete thickness of greater than six (6) inches.

2. Reinforcement mesh shall extend to within three (3) inches of the edge of the concrete block or foundation.

CS 13 REGENERATION TANK PLACEMENT

Four regeneration (regen) tanks are used to mix and supply regen solution for the zeolite cells. Two regen tanks are located on the west side of the north zeolite trains and two regen tanks are located on the west side of the south zeolite trains as shown on Sheets 11 and 12. The tanks will have a 10,000 gallon capacity and will have a diameter of approximately twelve (12) feet.

CS 13.1 TANK FOUNDATION

The tank foundations shall be constructed as reinforced concrete as described in CS 12.

CS 13.2 TANK PLACEMENT

A. The tanks shall not be placed until the MANAGER has approved the foundation.
B. The tanks shall not be placed during periods of high winds or when weather conditions present a hazard to workers or equipment.
C. The tanks shall be hoisted, lifted and/or moved in accordance with manufacturer's recommendations.
D. The tanks shall be placed and centered on the foundations as shown on Sheets 11, 12 and 28.
E. The tanks shall be positioned such that outlet at the base of the tank is on the east side of the tanks and pointed toward the zeolite cells.
F. The tanks shall be anchored to the foundation as soon as possible after placed on the zeolite pad.
G. If the tanks do not have a factory installed base outlet, a six (6) inch diameter flange type base outlet will be installed on the east side of each tank.

CS 14 ACID TANK PLACEMENT

Two double-walled acid storage tanks shall be placed on the pad as shown in Sheets 11 and 28. The tanks will have an 8,700 gallon capacity and will have a diameter of approximately twelve (12) feet.

CS 14.1 TANK FOUNDATION

The tank foundations shall be constructed as reinforced concrete as described in CS 12.

CS 14.2 TANK PLACEMENT

A. The tanks shall not be placed until the MANAGER has approved the foundation.
B. The tanks shall not be placed during periods of high winds or when weather conditions present a hazard to workers or equipment.
C. The tanks shall be hoisted, lifted and/or moved in accordance with manufacturer's recommendations.
D. The tanks shall be placed and centered on the foundations as shown on Sheets 11, 12 and 28.
E. The tanks shall be positioned such that outlet (drain) at the base of the tank is on the east side of the tanks and pointed toward the zeolite cells.
F. The tanks shall be positioned such that the fill line is on the west side of the tanks.
G. The North acid tank shall be positioned such that the manway is on the north side of the tank.
H. The South acid tank shall be positioned such that the manway is on the south side of the tank.
I. The tanks shall be anchored to the foundation using manufacturer supplied anchorage equipment as soon as possible after placed on the zeolite pad.
J. Only manufacture supplied or approved fittings shall be connected directly to the tank.

CS 15 SAFETY SHOWER INSTALLATION

This section describes the requirements for installation of the safety shower building and the components within the safety shower.

CS 15.1 COMPONENTS

The following components to be assembled by the CONTRACTOR will be procured by HMC.

A. 8 ft. X 10 ft. steel or aluminum sided prefabricated building or similar constructed building with a walk in door on the end of the building.

B. 500 gallon doorway water tank.

C. Safety shower and enclosure.

D. Wash basin, stand, and accessories.

E. 1 horsepower water pump.

F. 1.25 inch PVC Schedule 80 pipe, fittings, and valves.

CS 15.2 INSTALLATION

A. The CONTRACTOR shall place the prefabricated building in the location shown on Sheet 12 of the drawings.

B. Prior to placement of the building, the CONTRACTOR shall ensure that the foundation where the building will be set is level and compacted. Refer to CS 6 for sub-base and base material requirements.

C. The building shall be set so that the walk in door is facing north.

D. The CONTRACTOR shall install the doorway 500 gallon poly water tank as shown on Sheet 27 of the drawings.

E. The CONTRACTOR shall install the shower enclosure and safety shower as shown on Sheet 27.

F. The CONTRACTOR shall install the wash basin and stand as shown on Sheet 27.

G. The CONTRACTOR shall install the 1 horsepower water pump in the location shown on Sheet 27.

H. All piping, fittings, and valves shall then be installed as shown. The CONTRACTOR will refer to CS 7 for PVC pipe installation procedures.

I. The drain piping from the safety shower and wash basin shall be installed on grade to discharge to Cell B1 as shown on Sheet 27.

CS 16 CONTROL BUILDINGS

This section describes the requirements for the placement of 2 (two) process control buildings. In addition, process control piping will be installed immediately adjacent to each building. An insulated wooden framed cover will be constructed around the piping to prevent freezing.

CS 16.1 BUILDINGS

HMC will procure the process control buildings. They will meet the following specifications:

A. Two (2) aluminum or steel-sided prefabricated or constructed buildings. Each building will have a single walk in 3 ft. wide door.

B. The building dimensions as shown on Sheet 12 are 12 ft. by 16 ft. However, HMC may elect to use a smaller prefabricated or constructed building (e.g. 10 ft. by 12 ft.).

CS 16.2 PLACEMENT

A. The CONTRACTOR shall place the two (2) process control buildings on the pad in the location depicted on Sheet 12.

B. Prior to building placement, the CONTRACTOR shall ensure that foundation material where the buildings are placed is level and compacted per the requirements of CS 6.

C. The buildings shall be placed so the doors are facing each other and the water intake distribution manifold as shown on Sheet 12.

D. The CONTRACTOR will not be responsible for any installations inside of the process control buildings.

E. Once the buildings are in place and the process control piping, flowmeters, and acid injection ports are installed, the CONTRACTOR shall construct a wooden cover over the process piping. The cover must have functional access doors or panels installed.

F. When the cover is completed, the building interior shall be fully insulated to ensure that freezing of these components does not occur.

CS 17 HYDROSTATIC TESTING

CS 17.1 GENERAL

This section describes the required testing of water supply and discharge pipelines to demonstrate adequacy of the piping systems.

CS 17.2 LIMITATIONS OF TESTING

Because a practical hydrostatic testing of the piping system within the zeolite pad area requires that supply piping to the zeolite be completed and connected to a suitable water source for testing, preliminary testing using air pressurization may be required by the MANAGER. A hydrostatic test will also introduce water into the piping network and zeolite cells and that may not be desirable until system startup is imminent. MANAGER may require preliminary testing of portions of the piping system as they are completed. In addition, the MANAGER may require wide scale hydrostatic testing of the piping system when practical.

CS 17.3 OBSERVATION

A. All hydrostatic testing and/or air pressurization testing of all water supply and discharge piping shall be under the full-time observation of and shall meet the approval of the MANAGER.

B. The maximum testing pressure shall <u>not</u> exceed the working pressure rating (WPR) of the lowest pressure rated component undergoing testing at any given time.

CS 17.4 PRELIMINARY TESTING

A. MANAGER may require preliminary testing of the piping using air pressurization.

B. The maximum testing pressure with compressed air shall <u>not</u> exceed 9 psi or the working pressure rating (WPR) of the lowest pressure rated component undergoing testing at any given time.

C. Before any testing with pressurized air or water is considered, the piping network shall be inspected to confirm that a pipe or joint failure will not result in a pipe whip hazard. Sections of pipe that are potentially subject

to pipe whip and cannot be anchored or restrained will be excluded from testing.

D. The testing procedure will at the direction of MANAGER and shall include:

1. Assemble pipe fitting to connect compressed air to piping to be tested. The air connection assembly shall include an airtight shutoff valve, a pressure gauge and a release valve.
2. Close selected valves to isolate the portion of the piping network to be tested.
3. Connect the compressed air supply to the piping network.
4. Open valve to apply compressed air to piping network. Maximum allowable pressure is 9 psi.
5. Close air valve to isolate pressurized pipe section.
6. Monitor pressure in tested section for a minimum of thirty (30) minutes. If pressure does not vary more than three (3) psi, the results are considered adequate for preliminary testing.
7. If pressure drops more the three (3) psi or fails to stabilize, the piping should be inspected to locate external leaks. Smoke candles may be useful in locating external leaks.
8. If pressure drop continues and external leaks are not located, check valve settings and, if possible, change valve settings to add or exclude sections of pipe to identify internal leakage through valves.
9. Repair or replace leaking pipe sections or fittings.
10. Retest repaired pipe sections.

CS 17.5 HYDROSTATIC TESTING OF WATER SUPPLY PIPING

A. MANAGER may require hydrostatic testing of the piping using fresh or treated water.

B. The maximum testing pressure with water shall <u>not</u> exceed 100 psi or the working pressure rating (WPR) of the lowest pressure rated component undergoing testing at any given time.

C. Before any testing with water is considered, the piping network shall be inspected to confirm that a pipe or joint failure will not result in a pipe whip hazard. Sections of pipe that are potentially subject to pipe whip and cannot be anchored or restrained will be excluded from testing.

D. The testing procedure will at the direction of MANAGER and shall include:

1. Assemble pipe fitting to connect pressurized water supply to piping to be tested. The water supply assembly shall include a shutoff

valve, a pressure gauge and a release valve. If pressurized water is supplied from a pressure tank, water tower, or pressure regulated demand pump, a flowmeter or other means of measuring water flow into the pipe during testing must be included in the water supply assembly.

2. Close selected valves to isolate the portion of the piping network to be tested.
3. Connect the pressurized water supply to the piping network.
4. Set maximum allowable pressure on water supply. Maximum allowable pressure is 100 psi or the working pressure rating (WPR) of the lowest pressure rated component undergoing testing at any given time. The allowable pressure must be reduced by the elevation difference between the water supply assembly and the lowest point of the piping in the test.
5. Open valve to fill the piping network with water at full pipe water velocity of not more than one (1) foot per second. Monitor air vents and/or open connecting valves to ensure all air is expelled from pipe during filling process.
6. Monitor pressure in tested section for a minimum of thirty (30) minutes. If pressure does not vary more than five (5) psi and no measurable water addition is necessary to maintain pressure, the results are considered adequate for hydrostatic testing.
7. If pressure drops more the five (5) psi or a measurable volume of water is added to maintain pressure, the piping should be inspected to locate external leaks.
8. If pressure drop continues and external leaks are not located, check valve settings and, if possible, change valve settings to add or exclude sections of pipe to identify internal leakage through valves.
9. Repair or replace leaking pipe sections or fittings.
10. Retest repaired pipe sections.

CS 18 HEXA ARMOR INSTALLATION

This section describes the requirements for installation of the Hexa Armor Rhombo Hexagonal cell covers.

CS 18.1 INSTALLATION SEQUENCING

A. HMC will procure the Hexa Armor Rhombo Hexagonal cell cover material. Specifications of the cell covers can be found in Appendix E.

B. The Hexa Armor will arrive via semi tractor-trailer rigs. The CONTRACTOR will be required to off-load the trucks and select an area to store the cover material until time of installation.

C. The CONTRACTOR will install the cell cover material following the complete hydrostatic testing (see CS 17) of the entire treatment system.

CS 18.2 INSTALLATION PROCEDURES

A. The CONTRACTOR shall install the Hexa Armor into each of the 12 zeolite cells, on top of the zeolite, to provide a distribution of 10 Hexa Armor balls per square foot of surface area.

B. Note that cells #1, #2, and #3 of each train have a different surface area with all cells #1 having a larger surface area than all cells #2, and cells #2 having a larger surface area than all cells #3. Refer to the drawings for accurate surface area information.

CS 19 BORROW SOIL AREA/LAYDOWN AREA REVEGETATION

This section details the requirements for final grading and reclamation of the north borrow soil area, west borrow soil area, equipment laydown area, and access road to the laydown area. These areas are shown on Sheet 3 of the drawings.

CS 19.1 ACREAGES

The following acreages are approximate for the areas to be reclaimed and revegetated:

North Borrow Soil Area – 10.5 acres
West Borrow Soil Area – 5.0 acres
Equipment Laydown Area – 1.5 acres
Access Road to Laydown Area – 1.5 acres

CS 19.2 SEED MIX RATES AND MULCH RATES

The following table depicts the reclamation seed mix for the reclamation of the borrow soil areas, laydown area, and access road. In addition, mulch rates are also described.

Table CS 19-1. Reclamation Seed Mix

COMMON NAME	SCIENTIFIC NAME	VARIETY/SOURCE	APPLICATION RATE - DRILL SEED LBS/ACRE - PURE LIVE SEED (PLS)
Thickspike Wheatgrass	Agropyron dasystacum	Critana	2
Western Wheatgrass	Agropyron smithii	Arriba	3
Blue Grama	Bouteloua curtipendula	Hachita or Alma	2
Sideoats Grama	Bouteloua gracilis	Niner or Vaughn	2
Munro Globemallow	Sphaeralacea munroana	Native	0.5
4-Wing Saltbush	Atriplex canescens	Native	3
TOTAL PLS			**12.5**

Straw mulch shall be applied at a rate of **5 tons/acre**.

CS 19.3 RECLAMATION GRADING

A. The revegetation areas must be prepared by the CONTRACTOR prior to revegetation activities.

B. The outer cut berm of the borrow areas and laydown area shall be bladed and blended into the borrow area surface so that a smooth transition from the native soils to the reclaimed soils exists.

C. Erosion cuts or rills must also be bladed and repaired as necessary.

D. Any remaining small soil stockpiles shall be dozed and graded to blend into the reclamation topography.

E. Bladed soil along the access road shall be bladed into the road and smoothed.

CS 19.4 REVEGETATION PRACTICES

A. The CONTRACTOR shall prepare the revegetation surface of all areas by disking the surface with a heavy construction grade disk. With the exception of the access road, the disking will occur in all other areas in two perpendicular directions to ensure that adequate soil tilth occurs.

B. The CONTRACTOR shall <u>not</u> smooth the disked areas prior to seeding. It is required that the reclamation surface be rough to aid in reduction of windblown erosion following revegetation.

C. The CONTRACTOR shall drill seed the revegetation areas with the required seed mix detailed above and using the required pure live seed rates. Only seed drills, such as the Rangeland Reclamation Drill, or similar, may be used on this project. Agricultural drills are not acceptable.

D. The CONTRACTOR must ensure the calibration of the seed drill and seed rate prior to drilling. This process must be observed and approved by the MANAGER.

E. Following drill seeding, the seeded areas shall be mulched with straw mulch at a rate of 5 tons per acre. Mulch shall be applied with a Haybuster Bale Processor, or similar equipment. Under no circumstances shall mulch be applied using chopper/blower equipment.

F. Following application of the mulch, the CONTRACTOR shall crimp the mulch into the soil using a mulch crimper. Under no circumstances shall the mulch be incorporated into the soil using disk implements.

CS 20 MANIFOLD BUILDINGS OR ENCLOSURES

This section describes the requirements for the placement of a booster station and treated water manifold buildings or enclosure. The two buildings or enclosures will be installed to house piping manifolds after construction of the manifolds.

CS 20.1 BUILDINGS

HMC will procure the manifold buildings or enclosures.

CS 20.2 PLACEMENT

A. At the direction of MANAGER, the CONTRACTOR shall place the two buildings or enclosures on the concrete pads at the locations depicted on Sheet 33.

Appendix A. Borrow Soil Testing Results

PROCTOR TEST RESULTS

Project: Grants Reclamation Project Homestake
EEG Project No.: A15-97
Sample: A-1
Method: ASTM D-698 A, Dry Mechanical

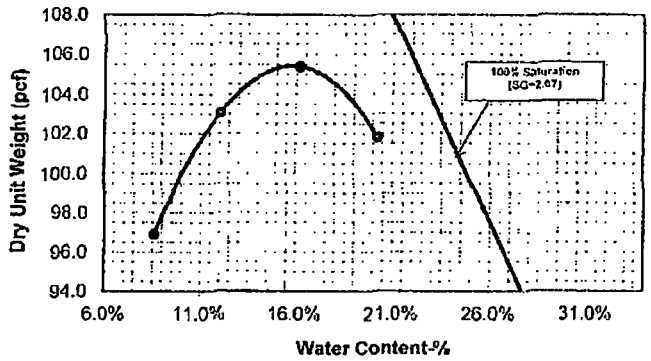
Unified Classification: CL
Description: Lean Clay

As Received Moisture Content: 12.9%

Sieve:	1	3/4	3/8	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
Percent Passing:	100.0%	100.0%	99.3%	99.3%	99.2%	98.9%	97.8%	92.9%	79.1%	56.9%

Liquid Limit: 38%
Plasticity Index: 19%

Compaction Curve:



Oversize Correction Data:

Fine Fraction:
Fine Fraction Moisture Content:
Dry Unit Weight of Fine Fraction:
Coarse Fraction
Bulk Specific Gravity: 2.67
Coarse Aggregate Moisture Content: 1.7%

Max Dry Unit Weight (pcf):	105.4
Opt. Water Content (%):	15.8%

Estimated R-Value

Earthworks Engineering Group, LLC
7901 Lorraine Ct NE
Albuquerque, NM 87113
(505) 899-4886

PROCTOR TEST RESULTS

Project: Grants Reclamation Project Homestake
EEG Project No.: A15-97
Sample: A-2
Method: ASTM D-698, A. Dry Mechanical

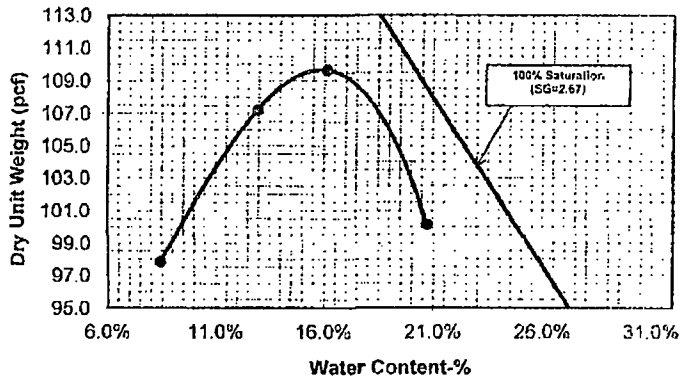
Unified Classification: SC
Description: Clayey Sand

As Received Moisture Content: 13.4%

Sieve:	1	3/4	3/8	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
Percent Passing:	100.0%	100.0%	100.0%	99.9%	99.8%	99.7%	98.2%	91.1%	69.8%	46.9%

Liquid Limit: 30%
Plasticity Index: 15%

Compaction Curve:



Oversize Correction Data:

Fine Fraction
Fine Fraction Moisture Content:
Dry Unit Weight of Fine Fraction:
Coarse Fraction:
Bulk Specific Gravity: 2.67
Coarse Aggregate Moisture Content: 1.7%

Max Dry Unit Weight (pcf):	109.5
Opt. Water Content (%):	15.8%

Estimated R-Value

Earthworks Engineering Group, LLC
7901 Lorraine Ct NE
Albuquerque, NM 87113
(505) 899-4886

PROCTOR TEST RESULTS

Project: Grants Reclamation Project Homestake
EEG Project No.: A15-97
Sample: A-3
Method: ASTM D-698 A. Dry, Mechanical

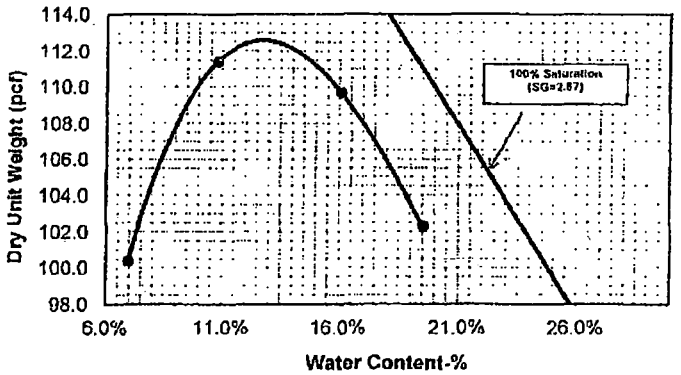
Unified Classification: SC
Description: Clayey Sand

As Received Moisture Content: 13.5%

Sieve:	1	3/4	3/8	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
Percent Passing:	100.0%	100.0%	100.0%	100.0%	99.8%	99.6%	98.0%	91.2%	72.9%	49.1%

Liquid Limit: 27%
Plasticity Index: 10%

Compaction Curve:



Oversize Correction Data:

Fine Fraction:	
Fine Fraction Moisture Content:	
Dry Unit Weight of Fine Fraction:	
Coarse Fraction:	
Bulk Specific Gravity:	2.67
Coarse Aggregate Moisture Content:	1.7%

Max Dry Unit Weight (pcf):	112.5
Opt. Water Content (%):	12.7%

Estimated R-Value

Earthworks Engineering Group, LLC
7901 Lorraine Ct NE
Albuquerque, NM 87113
(505) 899-4886

PROCTOR TEST RESULTS

Project: Grants Reclamation Project Homestake
EEG Project No.: A15-97
Sample: B-1
Method: ASTM D-698, A, Dry, Mechanical

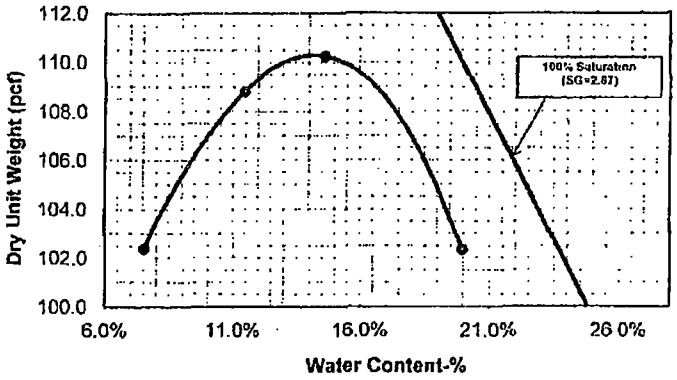
Unified Classification: CL
Description: Lean Clay

As Received Moisture Content: 12.8%

Sieve:	1	3/4	3/8	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
Percent Passing:	100.0%	100.0%	100.0%	99.9%	99.6%	99.2%	97.7%	91.8%	76.5%	54.1%

Liquid Limit: 29%
Plasticity Index: 13%

Compaction Curve:



Oversize Correction Data:

Fine Fraction:
Fine Fraction Moisture Content:
Dry Unit Weight of Fine Fraction:
Coarse Fraction:
Bulk Specific Gravity: 2.67
Coarse Aggregate Moisture Content: 1.7%

Max Dry Unit Weight (pcf):	110.3
Opt. Water Content (%):	14.2%

Estimated R-Value

Earthworks Engineering Group, LLC
7901 Lorraine Ct NE
Albuquerque, NM 87113
(505) 899-4886

PROCTOR TEST RESULTS

Project: Grants Reclamation Project Homestake
EEG Project No.: A15-97
Sample: B-2
Method: ASTM D-698, A, Dry, Mechanical

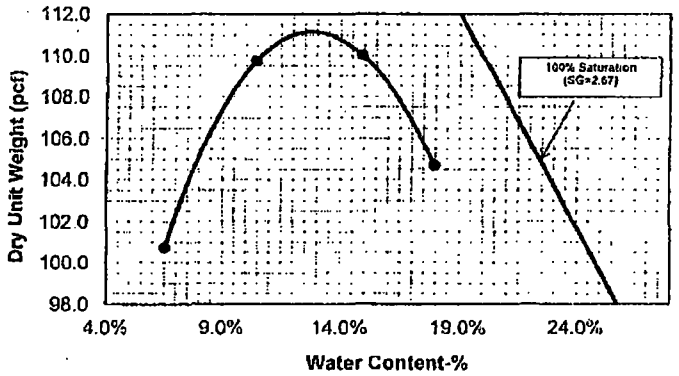
Unified Classification: CL
Description: Lean Clay

As Received Moisture Content: 9.5%

Sieve:	1	3/4	3/8	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
Percent Passing:	100.0%	100.0%	100.0%	99.7%	99.5%	99.3%	98.2%	93.1%	77.7%	50.7%

Liquid Limit: 26%
Plasticity Index: 9%

Compaction Curve:



Oversize Correction Data:

Fine Fraction:
Fine Fraction Moisture Content:
Dry Unit Weight of Fine Fraction:
Coarse Fraction:
Bulk Specific Gravity: 2.67
Coarse Aggregate Moisture Content: 1.7%

Max Dry Unit Weight (pcf):	111.1
Opt. Water Content (%):	12.7%

Estimated R-Value

Earthworks Engineering Group, LLC
7901 Lorraine Ct NE
Albuquerque, NM 87113
(505) 899-4886

PROCTOR TEST RESULTS

Project: Grants Reclamation Project Homestake
EEG Project No.: A15-97
Sample: B-3
Method: ASTM D-698, A, Dry Mechanical

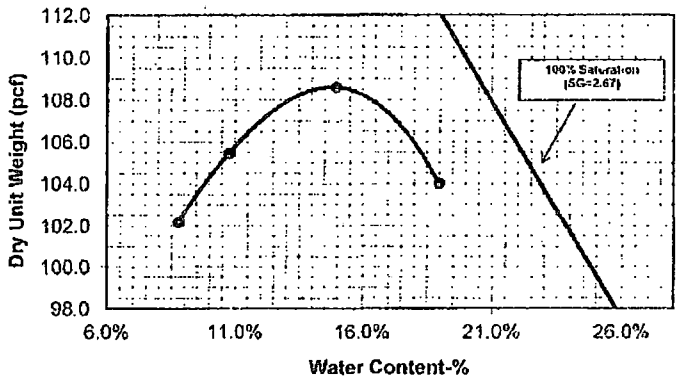
Unified Classification: SC
Description: Clayey Sand

As Received Moisture Content: 12.1%

Sieve:	1	3/4	3/8	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
Percent Passing:	100.0%	100.0%	100.0%	99.9%	99.6%	98.9%	96.9%	89.3%	71.1%	48.5%

Liquid Limit: 29%
Plasticity Index: 12%

Compaction Curve:



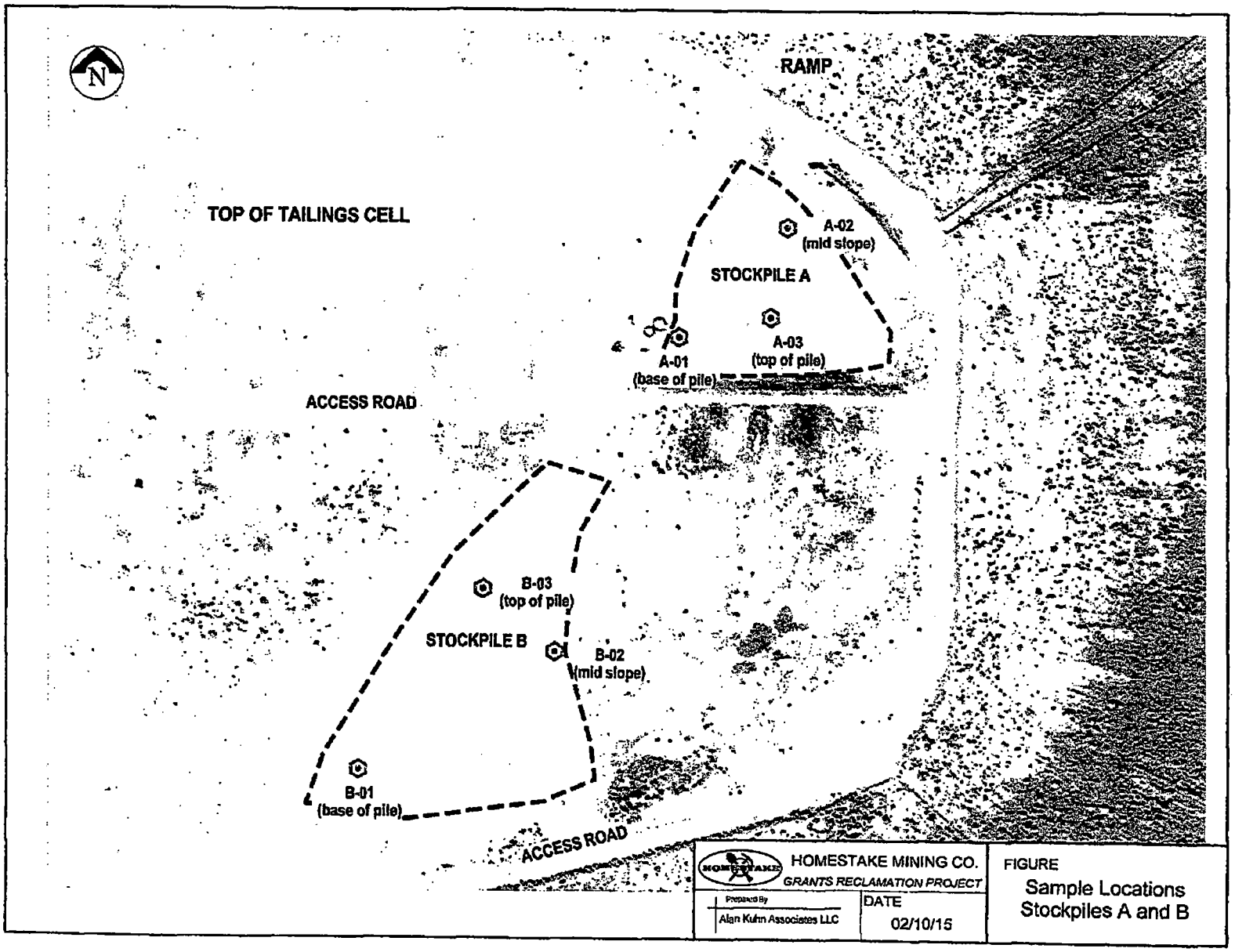
Oversize Correction Data:

Fine Fraction:
Fine Fraction Moisture Content:
Dry Unit Weight of Fine Fraction:
Coarse Fraction:
Bulk Specific Gravity: 2.67
Coarse Aggregate Moisture Content: 1.7%

Max Dry Unit Weight (pcf):	108.5
Opt. Water Content (%):	14.8%

Estimated R-Value

Earthworks Engineering Group, LLC
7901 Lorraine Ct NE
Albuquerque, NM 87113
(505) 899-4886


N
RAMP
TOP OF TAILINGS CELL
A-02
(mid slope)
STOCKPILE A
A-03
(top of pile)
A-01
(base of pile)
ACCESS ROAD
B-03
(top of pile)
STOCKPILE B
B-02
(mid slope)
B-01
(base of pile)
ACCESS ROAD
HOMESTAKE MINING CO.
GRANTS RECLAMATION PROJECT
Prepared By
Alan Kuhn Associates LLC
DATE
02/10/15
FIGURE
Sample Locations
Stockpiles A and B

Sample Description Log

Sample No.	Sample Depth (ft.)	Sample Type	Care Category	Sampled By	Date Sampled	USCS Soil Description	Comments
A-01	0-1	5 Gal Bucket	Disturbed	Ed Loescher	2/10/2015	Sandy Clay (CL)– sandy clay, brown, moist to dry	Sampled from Stockpile A The sample was located at the SW corner and at the base of the Stockpile.
A-02	0-1	5 Gal Bucket	Disturbed	Ed Loescher	2/10/2015		Sampled from Stockpile A The sample was located at the NE slope and midway up the slope of the Stockpile.
A-03	0-1	5 Gal Bucket	Disturbed	Ed Loescher	2/10/2015		Sampled from Stockpile A. The sample was located at the S slope and at the top of the Stockpile.
B-01	0-1	5 Gal Bucket	Disturbed	Ed Loescher	2/10/2015	Sandy Clay (CL)– sandy clay, brown moist to dry	Sampled from Stockpile B The sample was located at the SW corner and at the base of the Stockpile.
B-02	0-1	5 Gal Bucket	Disturbed	Ed Loescher	2/10/2015		Sampled from Stockpile B The sample was located at the NE slope and midway up the slope of the Stockpile.
B-03	0-1	5 Gal Bucket	Disturbed	Ed Loescher	2/10/2015		Sampled from Stockpile B The sample was located at the N slope and at the top of the Stockpile
C-01	0-1	5 Gal Bucket	Disturbed	Ed Loescher	2/10/2015	Sand (SP-SM) - Sand with some silt, light brown, moist to dry	Sampled from Stockpile C The sample was located at the NW corner and at the base of the Stockpile.
C-02	0-1	5 Gal Bucket	Disturbed	Ed Loescher	2/10/2015		Sampled from Stockpile C The sample was located at the NE slope and midway up the slope of the Stockpile.
C-03	0-1	5 Gal Bucket	Disturbed	Ed Loescher	2/10/2015		Sampled from Stockpile C The sample was located at the S corner and at the top of the Stockpile.

Appendix B. Zeolite Specifications

St. Cloud Mining Company
P.O. Box 1670 Truth or Consequences, New Mexico 87901
Phone: 505-743-5215 Fax: 505-743-3333 website:
Email

St. Cloud Natural Zeolite (Clinoptilolite)

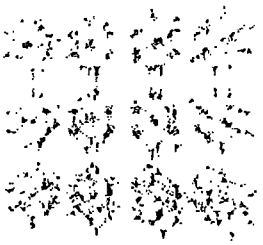
Product Information Sheet

Natural zeolites are a unique type of microporous volcanic mineral with sieving and cation exchange properties for use in agriculture, environmental and industrial applications. St. Cloud Mining Company is the largest producer of natural zeolite in North America.

- **Uses of St. Cloud Zeolite**

St. Cloud Zeolite has hundreds of proven uses, and the list continues to grow. St. Cloud Zeolite is a natural mineral produced by all natural means, and is used as an animal feed supplement that has been shown to improve health and reduce the negative effects of animal waste; as an additive to animal stalls and pens to reduce ammonia and other emissions to air and water; as a soil amendment to retain water and plant nutrients in root zones, which conserves both; for a number of other horticultural and agricultural uses, including being the only zeolite endorsed for use in space by NASA; as a water filtration media that removes ammonia, some heavy metals and other constituents; and dozens of other uses.

- **Physical Properties**



Bulk Density (In Place, dried) ..... 87 lbs/ft^3 (1,390 kg/m^3)
Bulk Density (Aggregate, dried, Common sizes)
- 4 X 6 Mesh ..... 44-48 lbs/ft^3
- 6 X 14 Mesh ..... 45-47 lbs/ft^3
- 14 X 40 Mesh ..... 46-49 lbs/ft^3
- -40 Mesh ..... 48-52 lbs/ft^3
- -100 Mesh ..... 49-53 lbs/ft^3
- -325 Mesh ..... 43-47 lbs/ft^3

Clinoptilolite content ..... 75 to 85%
Cation Exchange Capacity (CEC) ..... 0.8 1.2 meq/g
Surface Charge density ..... 10.1E-23 meq/Å^2
Color ..... White (85 optical reflectance)
Crushing Strength ..... 2,500 lbs/in^2 (176 kg/m^2)
Hardness ..... 3.5-4.0 Mohs
LA Wear (Abrasion Index) 24
Molecular Ratio ..... 5.1 (Si/Al)
pH (natural) ..... 7.5 to 8.0
pH Stability 0-13
Permeability ..... 10^{-3} m/sec (1.4 0.4 mm particles)
Pore Size (diameter) ..... 4 - 7 angstroms
Pore Volume ..... ≤ 52%
Resistivity ..... - 9,000 ohms/cm
Specific Gravity ..... 2.2 - 2.4:1
External Surface Area ..... 14 to 15 m^2/g
Total Surface Area ..... ≥ 800 m^2/g
Swelling Index ..... nil
Thermal Stability ..... 1,202° F (650° C)
Other ..... non-soluble, non-slaking, free flowing, readily mixable

Page 1 of 2 Updated: September 2007

- **Chemical Analysis**
  ($Ca, Na_2, K_2)(Al_2SiO)\ 24H_2O$: Calcium-sodium-potassium aluminosilicate). In approximate weight percent for major oxides:

CaO	3.4%	MgO	1.5%	Na_2O	0.3%	Fe_2O_3	1.6%
K_2O	3.0 %	P_2O_5	0.05%	Al_2O_3	12.1%	SiO_2	70.0%

- **Chemical Composition** for selected elements by x-ray fluorescence (in weight % or ppm, as noted)

Ca	2.4 %	Mg	0.9 %	Na	0.1 %	Fe	0.6%	Cu	10 ppm
K	1.2 %	P	0.01%	Al	3.1 %	Si	32.9%	Zn	59 ppm

- **Cation Exchange Capacity**
  Total exchange capacity of 0.8 – 1.2 meq/g total, and an external exchange capacity of about 0.1 meq/g.

- **Major Exchangeable Cations**
  Rb, Li, K, Cs, NH_4, Na, Ca, Ag, Cd, Pb, Zn, Ba, Sr, Cu, Hg, Mg, Fe, Co, Al, Cr. (selectivity of above cations is a function of hydrated molecular size and relative concentrations).

- **Primary Adsorbing Gases:**
  CO, CO_2, SO_2, H_2S, NH_3, HCHO, Ar, O_2, N_2, H_2O, He, H_2, Kr, Xe, CH_3OH, Freon, formaldehyde, and mercaptans.

- **Environmental Properties**
  Zeolites are natural, inert, non-toxic substances which are federally classified as GRAS (Generally Regarded As Safe) in most applications and exempted from most regulations and reporting when used in accordance with good agricultural practice and when less than 2% in animal feed products (40 CFR, Part 180.1001 and elsewhere). St. Cloud Zeolite is USDA approved as an absorbent for spills in food processing facilities and complies with federal and state environmental requirements. No fibrous silicates have been detected and crystalline silica is present in quantities of less than 0.01%. Reference MSDS Sheet (product CAS No. 1318-02-1) for additional information.

- **Location** - St. Cloud's Zeolite operation is centrally located near Winston, New Mexico, approximately 35 miles west of Interstate 25 midway between Albuquerque, New Mexico and El Paso, Texas.

- **Reserves** - An 18.3 million ton zeolite reserve base mined from surface exposures 1.5 miles from plant site.

- **Delivery and Freight** - Motor carriers for packaged and bulk products for domestic and international destinations. Bulk rail facilities are available by special arrangement. UPS, LTL, and regional warehousing services also available. Warehouse customer pick-ups 8:00 am-3:00 PM, 5 days per week, or 24 hrs per day or by prior arrangement.

- **Trade Names**
  Sold by St. Cloud as Stone House® Cat Litter, Floor Drying Material and Natural Zeolite Crystal, and Heaven Scent®. Marketed or included in products by brokers, manufacturers and distributors as Ammo® Chips, Litter and Rocks, Ammonia-X®, A-Stone®, Biolite®, Clinolite®, EcoFresh®, Ecolite®, E-Z Dry®, Hydrosil®, PDZ® Sweet Stall®, Stall Fresh® Zeofresh, ZeoPro and others.

- **Packaging**
  Standard, private label and custom packaging and palletizing available including 10, 25, 50 lb. or other units in paper or plastic with stitch, taped, valve packed or heat sealed closures. Other off-site special packaging services available on request. Bulk packaging in approximately 1-ton and other supersacks or directly loaded in any bulk truck or rail car configuration including top loading or pneumatic carriers.

Information herein is accurate to the best of our knowledge, but may be subject to change without notice. Suggestions are made without warranty or guarantee of results. Before using, user should determine the suitability of the product for its intended use and user assumes the risk and liability in connection herewith.

Page 2 of 2 Updated: September 2007

St. Cloud Zeolite Screen Size Analysis

Nominal Particle Size Mesh	Approx. Particle Size Inches	Microns (um) Approx.	Millimeters (MM) Approx.	Lab Opening US Std. (Inches)	Plant Opening Mill Gr. (Inches)	Percentage (%) Retained on Laboratory Screens											
						Powders			Sands		Granules				Aggregates		
						-325 Mesh	-100 Mesh	-40 Mesh	40x80 Mesh	14x40 Mesh	8x14 mesh	6x14 mesh	6x8 mesh	4x8 Mesh	4 mesh x 1/2 in	1/2 in x 3/4 in	3/4 in x1 in
1 Inch	1	25,400	25.40	1.000	1.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3/4 Inch	3/4	19,050	19.00	0.750	0.750	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.9
1/2 Inch	1/2	12,700	13.00	0.500	0.500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	64.47	44.0
4 Mesh	7/32	4,760	4.70	0.157	0.215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	50.69	35.13	3.4
6 Mesh	9/64	3,360	3.40	0.132	0.139	0.00	0.00	0.00	0.00	0.00	0.00	0.21	1.06	75.67	46.83	0.56	0.0
8 Mesh	7/64	2,380	2.40	0.094	0.105	0.00	0.00	0.00	0.00	0.00	1.23	35.03	70.58	23.32	n/a	n/a	n/a
14 Mesh	3/64	1,410	1.40	0.055	0.054	0.00	0.00	0.00	0.00	0.12	67.06	64.70	27.38	0.59	4.72	0.55	0.0
20 Mesh	1/32	841	0.84	0.033	0.036	0.00	0.00	0.00	0.55	41.95	10.67	n/a	n/a	n/a	n/a	n/a	n/a
40 Mesh	1/64	420	0.42	0.017	0.017	0.00	2.00	0.70	5.01	53.66	0.47	4.31	n/a	n/a	0.11	0.33	0.4
70 Mesh	n/a	210	0.21	0.008	n/a	0.00	8.00	30.40	91.71	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
100 Mesh	n/a	149	0.15	0.006	n/a	0.00	8.20	14.80	2.04	4.62	0.10	0.09	0.21	0.07	0.28	0.34	0.4
<100 Mesh	n/a	<149	<.15	<.006	n/a	0.00	83.70	54.20	0.69	0.01	0.49	0.66	0.56	0.34	1.96	0.22	0.7
140 Mesh	n/a	105	0.10	0.004	n/a	0.00	7.70	14.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	0.0
200 Mesh	n/a	74	0.07	0.003	n/a	0.00	0.50	7.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	0.0
325 Mesh	n/a	44	0.04	0.002	n/a	1.50	10.90	6.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	0.0
<325 Mesh	n/a	<44	<0.04	<.0017	n/a	98.50	58.60	23.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	0.0
Typical Density (lbs/ft3)						45.0	51.5	50.3	50.1	49.0	46.0	48.4	46.0	44.7	48.0	50.5	48.5
Typical Moisture %						6.5	7.0	6.6	5.6	3.8	2.9	4.6	3.5	3.5	6.3	7.6	7.7

Notes: All laboratory analysis performed similar to ASTM D392. Method A. Laboratory Sieves are U.S. Standard mesh and plant screens are standard "mill grade".

Material Safety Data Sheet

Date Prepared: 05/22/2014
Supersedes: 09/03/2013

Section 1 – Product & Company Identification

Product Name:	Zeolite (Chabazite, Clinoptilolite)
Part Numbers:	Winston Cline (NM-Ca), Ash Meadows Cline (NV-Na), Rome Mordenite Bowie Chab (AZUB), (AZLB-Na) & (AZLB-Ca)
General Uses:	Water Filtration, Sorbent, Odor Control/Desiccant, Animal Feed Additive
Product Description:	White, Off White, or Tan Granules & Powders w/Dark Specs

Manufacturer's Name:	St. Cloud Mining Company	OR	SCM - Ash Meadows LLC
Street Address:	761 St. Cloud Rd		E. Spring Meadows Rd
P.O. Box:	P.O. Box 196		HCR 70-Box 7006
City, State, Zip:	Winston, NM 87942		Amargosa Valley, NV 89020
Phone:	575-743-5215		Phone/Fax: 775-372-5524
Fax:	575-743-3333		Country: U.S.A.

Section 2 – Hazardous Ingredients

Hazardous Ingredients:	May contain greater than 0.10% free silica
Hazardous Components:	Clinoptilolite Zeolite/potassium, calcium, sodium, aluminosilicate, hydrated (a)
Percent by Weight:	100%
CAS #:	12173-10-3 (Clinoptilolite), 1318-02-1 (Chabazite)
EINECS #:	Not found
Hazard Symbol:	Xn
Risk Phrases:	R20, 36/37/38

(a) Clinoptilolite is not listed on the Canadian DSL or NDSL.

Section 3 – Hazards Identification

Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No
	Clinoptilolite with a particle size in the respirable range was tested for carcinogenicity in rats by intratracheal instillation. No significant increase in the incidence of tumors was found.
Eye Contact:	May cause irritation.
Skin Contact:	May cause irritation.
Inhalation:	Causes irritation.
Ingestion:	No hazards known or suspected.
Chronic Hazards:	No known chronic hazards. Not listed by OSHA, NTP or IARC as a carcinogen. Does not contain asbestos or fibrous zeolite minerals. Crystalline silica was not detected by X-Ray Defraction Analysis, but may be present above the notification level of 0.10%. (Crystalline silica is considered a hazard by inhalation. During October 1996 IARC reviewed the literature for polymorphs of crystalline silica and determined that there is sufficient evidence in humans for the carcinogenity of inhaled crystalline silica in the form of quartz or cristobolite from occupational sources.)

Section 4 – First Aid Measures

Ingestion:	If ingested in large quantities, contact physician for permission to induce vomiting.
Inhalation:	Move subject to fresh air. Rinse mouth & nasal passages with fresh water. If irritation persists, seek medical attention.
Skin Contact:	Rinse with water. For tan-en persists, seek medical attention.
Eye Contact:	Remove contact lenses. Flush eyes with water for 15 minutes. If irritation persists, seek medical attention.
Notes to Physician:	St. Cloud Natural Zeolite has no additives or materials that require special treatment. Some St. Cloud products, however, are treated to enhance their use for special applications. A separate MSDS is available from the supplier for additives to the St. Cloud Natural Zeolite.

Section 5 – Fire Fighting Measures

General Hazards:	Product is not considered flammable or combustible.		
Flash Point (°F):	N/A	**Flammable Limits (Vapor in Air, Vol. %):**	N/A
Fire Extinguishing Media:	N/A	**Unusual Fire & Explosion Hazards:**	None

Section 6 – Accidental Release Measures

Environmental Hazards:	No known adverse effects.
Spillage:	Sweep, scoop, or vacuum discharged material.
Waste Disposal Method:	Landfill according to local, State & Federal regulations.

Section 7 – Handling & Storage

Precautions:	Keep container closed when not in use. Protect containers from abuse; store in a cool, dry area. Keep out of reach of children.

Section 8 – Exposure Controls / Personal Protection

OSHA Permissible Exposure Limit (or ACGIH):	Values have not been established.
Recommended Threshold Limit:	Ceiling Limit – 15 mg/m³ Total Dust 5 mg/m³ Respirable Fraction
Exposure Analysis Methods:	Respirable Sampler or Midget Impinger see: J. Amer. Ind. Hyg. Assoc. 28:554 (1967)
Respiratory Protection:	Use NIOSH approved dust mask or respirator where dust occurs. *Refer to 29 CFR 1910.134 or European Standard EN 149 for regulations.*
Gloves:	Plastic, rubber or cotton.
Eye Protection:	Safety glasses or chemical goggles *Refer to 29 CFR 1910.133 or European Standard EN166*
Other Protective Equipment:	N/A
Personal Hygiene:	Avoid breathing dust.
Engineering Control:	Use with adequate ventilation.

Material Safety Data Sheet

Date Prepared: 05/22/2014
Supersedes: 09/23/2013

Section 9 – Physical & Chemical Properties

Appearance & Odor:	Chabazite – Dry, tan granules & powders. Odorless Clinoptilolite – Dry, white to off-white granules & powders with specs.
Specific Gravity:	Chabazite – N/A (Liquids Only), Clinoptilolite = 2.2 – 2.4
Solubility in Water:	Chabazite – Negligible, Clinoptilolite – 0
Vapor Density:	N/A
Vapor Pressure:	Chabazite – N/A (mm Hg at °F, Nonaqueous Liquids Only) Clinoptilolite – N/A
Evaporation Rate:	Chabazite – N/A (Butyl Acetate = 100, Nonaqueous Liquids Only) Clinoptilolite – N/A
Solids Content:	Chabazite – N/A (Solutions, Dispersions or Pastes Only) Clinoptilolite – N/A
Melting Point:	Chabazite – N/A, Clinoptilolite – 1800°F
Boiling Point:	Chabazite – N/A (°F, Nonaqueous Liquids Only), Clinoptilolite = N/A
pH:	Chabazite – N/A (Aqueous Liquids Only), Clinoptilolite – N/A

Section 10 – Stability and Reactivity

Stability:	Stable	**Conditions to Avoid:**	N/A
Incompatibility (Materials to Avoid):	N/A	**Hazardous Decomposition Products:**	None
NFPA Hazard Ratings:	Health Hazard: 1 Reactivity: 0	Flammability Hazard: 0 Special Hazard: None	

Section 11 – Toxicological Information

Chabazite	CAS #1318-02-1	EINECS # (not found)	LC/LD50: N/A
Clinoptilolite	CAS #12173-10-3	EINECS # (not found)	LC/LD50: N/A

Section 12 – Ecological Information

No data available. None of the ingredients are classified as a Marine Pollutant.

Section 13 – Disposal Considerations

Dispose of in accordance with Local, State and Federal Regulations. Product is classified as non-hazardous, however, non-hazardous materials may become hazardous waste upon contact with other products. Refer to "40 CFR Protection of Environment Parts 260-299" for complete waste disposal regulations. Consult your local, state or Federal Environmental Protection Agency before disposing of any chemicals. According to the European Waste Catalogue, waste codes are application-specific and should be assigned by the user based on the application for which the product is used.

Section 14 – Transport Information

DOT Shipping Name:	Non-Hazardous for Transport	**IMDG Hazard Class:**	Not Regulated
DOT Hazard Class:	Not Regulated	**IATA Hazard Class:**	Not Regulated
UN/NA ID No.:	None	**RID/ADR Code:**	Not Regulated
UN TDG Class:	Not Regulated	**Label:**	None Required
Hazard Id No. (HIN):	None	**Hazard Symbols:**	None

Section 15 – Regulatory Information

TSCA (U.S.A. – Toxic Substance Control Act)
All components of this product are listed on the U.S. Toxic Substances Control Act Chemical Inventory or are exempted from listing because a Low Volume or Polymer Exemption has been granted in accordance with 40 CFR 723.50.

SARA TITLE III (U.S.A. – Superfund Amendments & Reauthorization Act)
311/312 Hazard Categories-Immediate Health. 313 Reportable Ingredients-None

CERCLA (U.S.A. – Comprehensive Response Compensation & Liability Act)
None

California Prop 65, Safe Drinking Water & Toxic Enforcement Act of 1986
There are no chemicals present known to the State of California to cause cancer or reproductive toxicity

CPR (Canadian Controlled Products Regulations)
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations. WHMIS Classification: Not controlled

IDL (Canadian Ingredient Disclosure List)
Components of this product identified by CAS number are listed on the Canadian Ingredient Disclosure List are shown in Section 2.

DSL/NDSL (Canadian Domestic Substances List / Non-Domestic Substances List)
Components of this product identified by CAS number are not listed on the DSL or NDSL, or are otherwise in compliance with the New Substances Notification (NSN) regulations. Only ingredients classified as "hazardous" are listed in Section 2 unless otherwise indicated.

EINECS (European Inventory of Existing Commercial Chemical Substances)
Components of the product identified by CAS numbers are on the European Inventory of Existing Commercial Chemical Substances unless indicated as "not found"

WGK Water Quality Index: nwg **VbK Index:** not applicable

Section 16 – Other Information

Notes & Full R-Phrase Text:	R20 Harmful by inhalation R36/37/38 Irritating to eyes, respiratory system and skin	
HMIS Hazard Ratings:	Health = 1 Physical Hazard – 0	Flammability = 0 Personal Safety Equipment = E

*Definitions: * = Chronic Health Hazard, 0 = Insignificant, 1 = Slight, 2 = Moderate, 3 = High, 4 = Extreme, E = Safety Glasses, Gloves, Dust Respirator*

Revision Summary: This MSDS has been revised as follows – Updated Format & Data

Additional Contact Information

Contact: Daniel T. Ryde, Chief Technology Officer
Email: [illegible]
Phone: (520) 744-8865

Contact: Joseph P. McNamee, Vice President-Sales
Email: [illegible]
Phone: (203) 265-1291

URL: http://www.[illegible].com

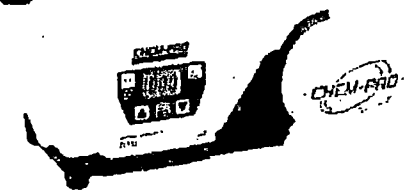
Appendix C. Pump Literature

ProSeries® CHEM-PRO® Diaphragm Metering Pump

by Blue-White Ind. | Engineering and Technical Data

CHEM-PRO C2 & C3

- Feed Rates to 40 GPH / 153 LPH
- System Pressures to 175 PSI / 12 bar
- Diaphragm Failure Detection
- PVDF/Ceramic Head Components
- Full Stroke Every Time Avoids Vapor Lock
- Quiet variable Speed Motor
- NEMA 4X (IP 66) Washdown
- 2 Year Warranty



NEMA 4X CE ETL DFD system

Applications:

- Chemical Metering
- Wastewater Treatment
- Municipal Water Treatment
- Boiler Treatment
- Cooling Tower Treatment
- Acid Injection
- Plating Chemical Injection
- Fluoridation
- Paper / Pulp Chemical Feed
- Fertilizer Injection

Features:

- Operator friendly digital controls with backlit LCD display and DFD alarm display.
- Signal inputs include: 4-20mA, pulse inputs, and Remote start/stop
- Signal outputs include: Relay (3 amp), open collector, 4-20mA (optional)
- Large PVDF, Ceramic, double ball check valves without metal springs.
- Priming and degassing valve built into the pump head.
- Backlit LCD displays motor speed, input signal values, service and alarm status.
- Includes Diaphragm Failure Detection (DFD) system.
- Compatible with Blue-White's Flow Verification Sensor (FVS) system.
- Alarm relay monitors the DFD system and the FVS system.
- SCADA ready 5-30V DC open collector output loop closes while motor is energized.
- NEMA 4X (IP66) wash-down, chemically resistant powder coated enclosure.
- **New Features Include :**
  - Patent pending Dia-Flex™ PVDF single-layer Diaphragm
  - Increased feed rate resolution, from 1% to 0.1%
  - Remote Start/Stop standard on all models
  - 4-20mA output available
  - Upgradeable firmware
  - Large single piece junction box – 40% larger
  - Terminal block connectors inside junction box
  - Larger, more intuitive control-pad
  - Protective LCD snap-on cover
  - Profibus, Profinet, Ethernet, Modbus TCP, and Modbus RTU options available

TDS 995000-036 1 of 4

CHEM-PRO® Diaphragm Metering Pump

Engineering and Technical Data

Specifications:

Maximum working pressure:
175 psig (12 bar) (model specific)

Maximum Fluid temperature:
130°F (54°C)

Operating Temperature:
14°F to 115°F (-10°C to 46°C)

Storage Temperature:
-40°F to 158°F (-40°C to 70°C)

Operating Voltage (Model Specific):
115VAC/60Hz, 1ph (1.5 Amp Maximum)
230VAC/60Hz, 1ph (0.7 Amp Maximum)
220VAC/50Hz 1ph (1.0 Amp Maximum)
240VAC/50Hz 1ph (1.0 Amp Maximum)

Power Cord Plug Type (Model Specific):
115V60Hz - NEMA 5/15 (USA)
230V60Hz - NEMA 6/15 (USA)
220V50Hz - CEE 7/VII (EU)
240V50Hz - AS 3112 (Australia/New Zealand)

Accuracy:
+/- 2% of full scale
Repeatability +/- 0.5%

Duty cycle:
Continuous

Output adjustment range:
1-100% in 0.1% increments

Maximum viscosity:
1,000 Centipoise

Maximum suction lift:
15 ft. Water, 0 psig (4.5 m, 0 bar)

Display:
Backlit LCD, UV resistant

Keypad:
Positive action tactile switch keypad

Enclosure:
NEMA 4X (IP66), Powder coated aluminum

Approximate shipping wt:
C2 models: 24 lb (10.9 Kg)
C3 models: 29 lb (13.1 Kg)

Materials of Construction:

Wetted components:

Pump Head Assembly:
Pump Head: ..... PVDF
Adapter Connections: ..... PVDF
Prime/Degassing Valve: ..... PVDF
Valve Cartridges: ..... PVDF
Valve Balls: ..... Ceramic
Valve Ball Seats: ..... TFE/P Tetrafluoroethylene/propylene
Static Seals: ..... FKM (optional EP)
Diaphragm: ..... PVDF

Injection / Back-flow Check valve:
Body & Insert: ..... PVDF
Check Ball: ..... Ceramic
Spring: ..... Hastelloy C-276
O-ring seals: ..... FKM (optional EP)

Foot Valve / Strainer:
Body & Adapter: ..... PVDF
Check Ball: ..... Ceramic
Spring: ..... Hastelloy C-276
O-ring seals: ..... FKM (optional EP)
Filter screen: ..... Polypropylene

Suction Tubing: ..... Clear PVC

Discharge Tubing
3/4" x 1/2" Tube connections: ....Not supplied
1/4" x 3/8" Tube connections: ..... Natural Polyethylene (LLDPE)

Non-Wetted components:

Enclosure:
413 Aluminum (Polyester powder coated)

Pump Head Cover:
413 Aluminum (Polyester powder coated)

Cover Screws:
300 Series Stainless Steel

DFD System Sensor pins:
Hastelloy C-276

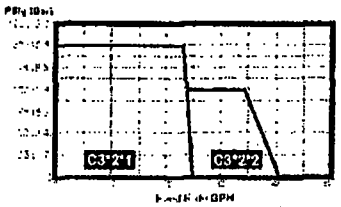
Power Cord:
3 conductor, SJTW-A Water-resistant

Tube Installation Tool:
GF Nylon

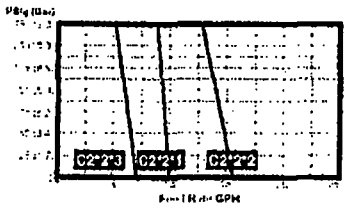
Mounting Brackets and Hardware:
316 Series Stainless Steel

Output Curves:

C3 Series Models



C2 Series Models



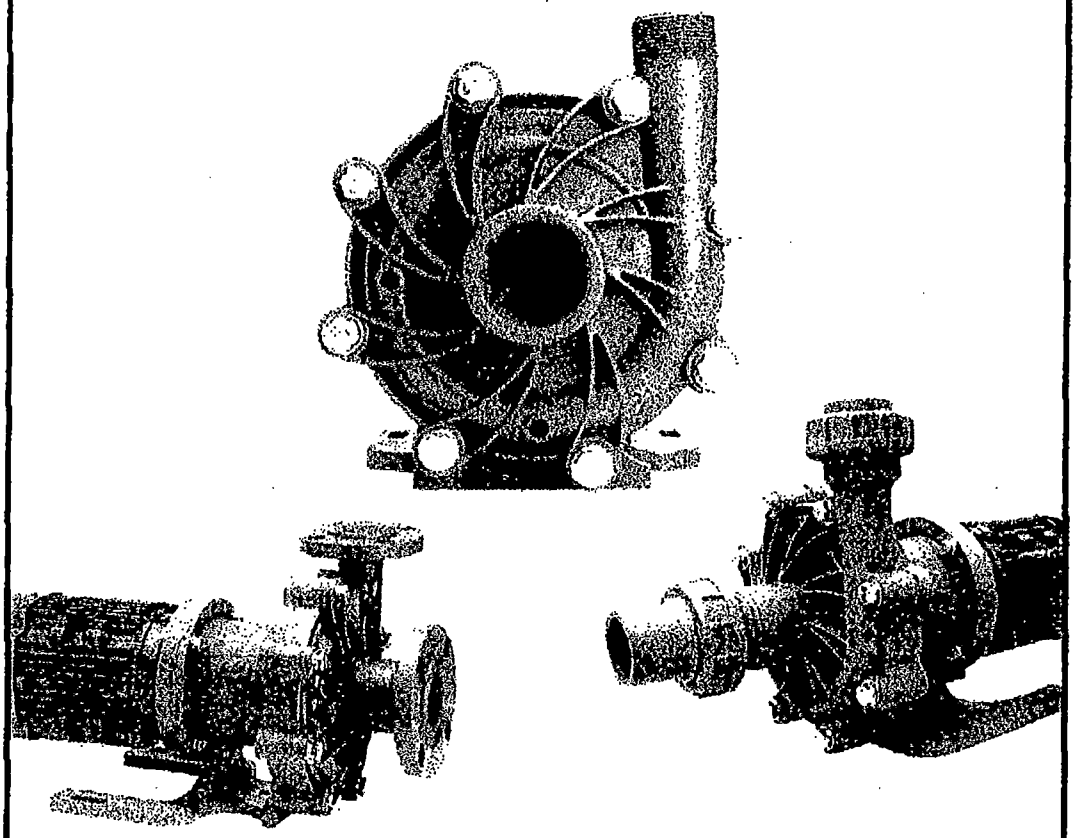
FINISH THOMPSON INC.

921 Greengarden Road • Erie, PA 16501-1591 U.S.A.
PH. 814-455-4478 • Fax 814-455-8518
Email: fti@finishthompson.com • www.finishthompson.com

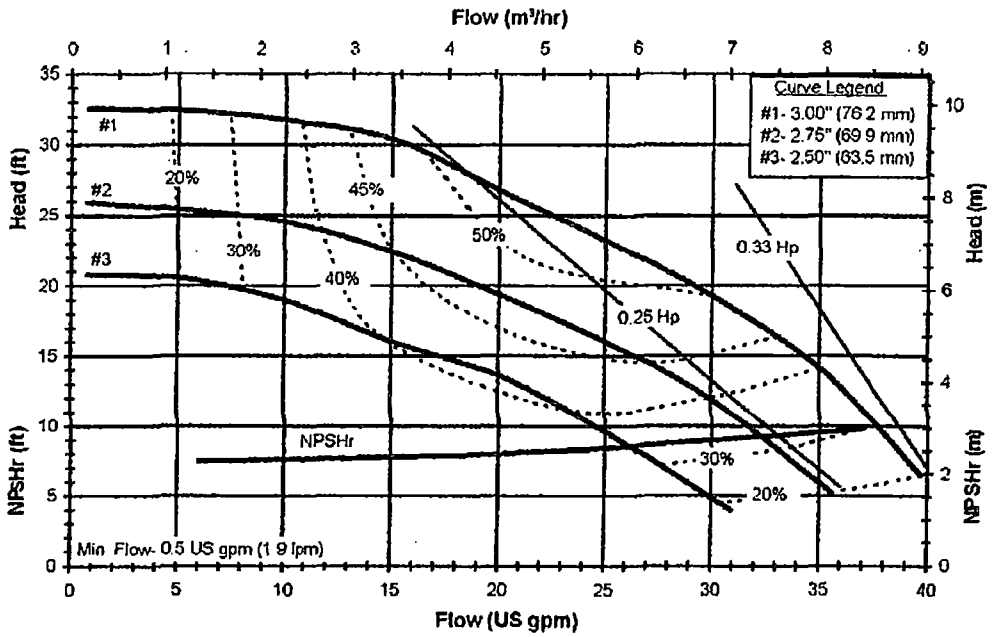
SALES: 1-800-934-9384
ORDER FAX: 1-814-459-3460
EMAIL: fti@finishthompson.com

DB SERIES SEALLESS CENTRIFUGAL PUMPS CURVEBOOK

Literature ID No. Ft06-922, R5



Model DB6
3450 rpm, 60 Hz
Suction: 1" FNPT
Discharge: 1" MNPT



FW1492
1113
Supersedes
1013

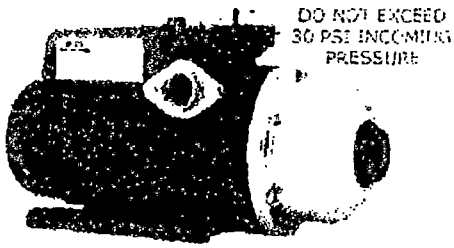
City Water Booster Pump

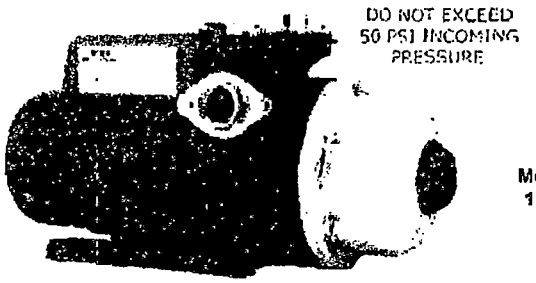
More pressure where you want it . . . when you need it!

- All-in-one unit, consisting of pump, motor, stainless steel pressure tank and electronic controller
- Compact design and quiet operation make it suitable for many applications
- System has automatic built-in diagnostics to protect against:
  Run Dry
  Dead Head
  Rapid Cycling
- Impeller constructed of thermo plastic with stainless steel bearing and shaft sleeve
- 1 in. stainless steel inlet and outlet flanges

C US
NSF/ANSI 372
25/405

Model VP05
1/2 HP





Model VP10
1 HP

PERFORMANCE

Inlet PSI	VP05 System Pressure (PSI) at Flow Rates (GPM)							HP
	3	6	9	12	15	18	21	
10	44	39	32	25	17	-	-	1/2
20	54	49	42	35	27	-	-	
30	64	59	52	45	37	-	-	

Inlet PSI	VP10 System Pressure (PSI) at Flow Rates (GPM)							HP
	3	6	9	12	15	18	21	
10	66	61	54	46	37	29	18	1
20	76	71	64	56	47	39	28	
30	86	81	74	66	57	49	38	
40	96	91	84	76	67	59	48	
50	106	101	94	86	77	69	58	

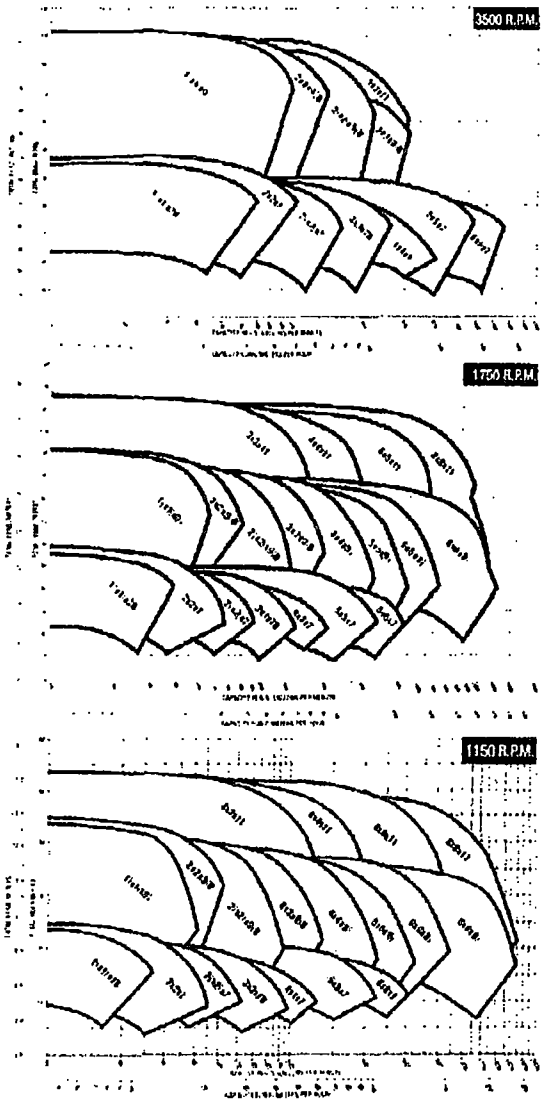
Flint & Walling | 95 North Oak Street | Kendallville, IN 46755
800 345 9422 | flintandwalling.com

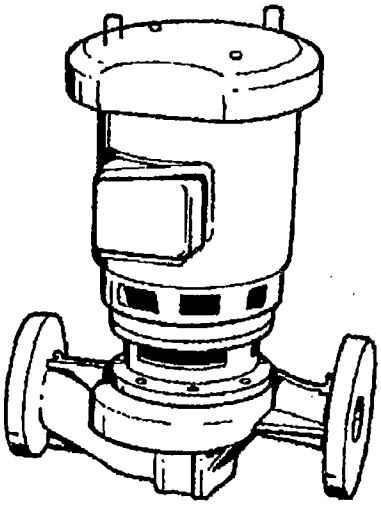
GOULDS WATER TECHNOLOGY
a xylem brand

CURVES
CAC1500

SERIES A-C 1500

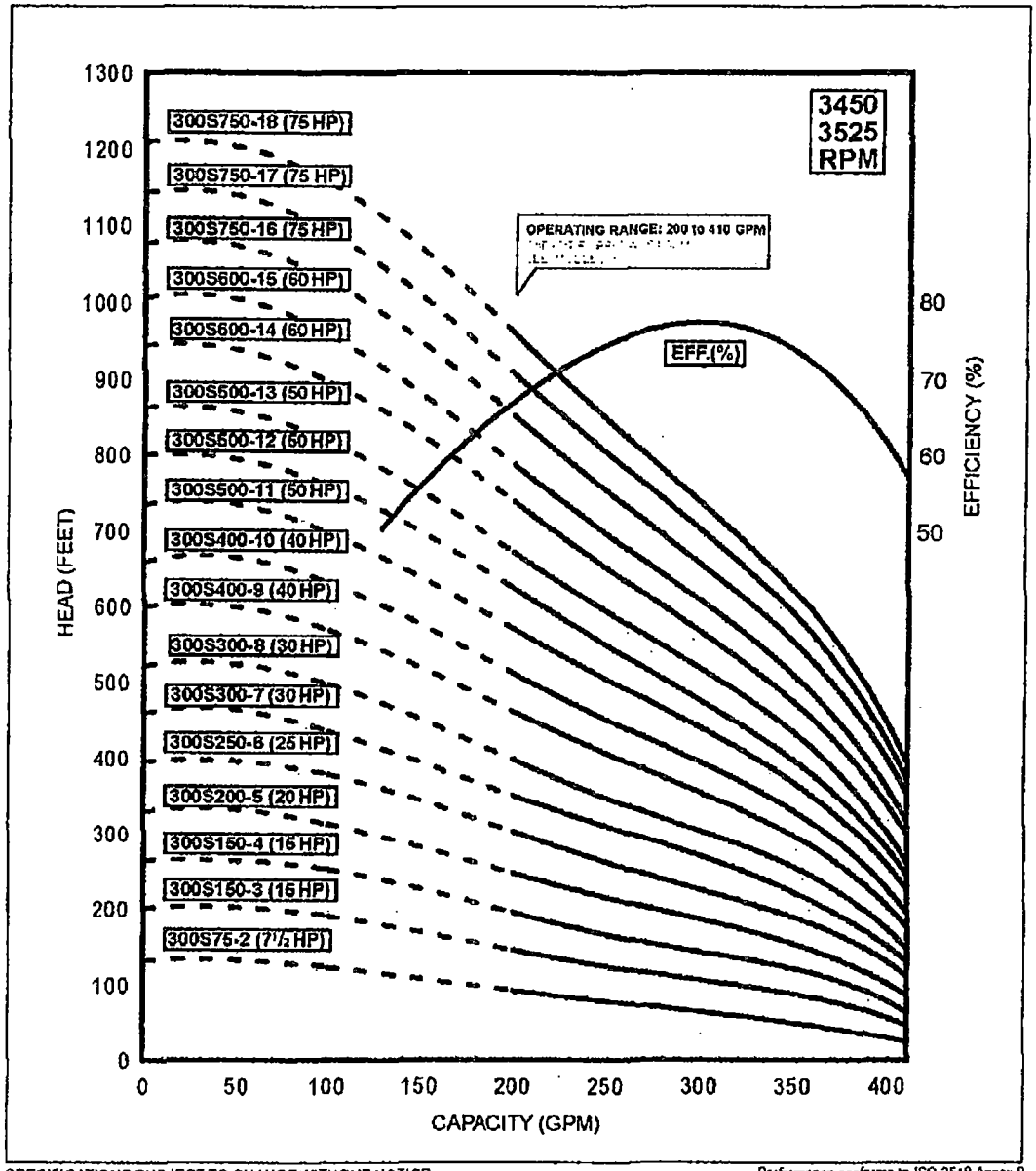
IN-LINE MOUNTED CENTRIFUGAL PUMP PERFORMANCE CURVES - 60 HZ





Model 300S 300 GPM Performance Curves

FLOW RANGE: 200 -410 GPM **OUTLET SIZE: 3"& 4" NPT*** **NOMINAL DIA. 6"**



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE
4" MOTOR STANDARD. 7.5 HP/3450 RPM
6" MOTOR STANDARD. 15-50 HP/3450 RPM.
8" MOTOR STANDARD. 60-75 HP/3525 RPM.
* 3" NPT 2-7 STAGES, 4" NPT 8-18 STAGES.

Performance conforms to ISO 2548 Annex B @ 8 ft. min. submergence

GRUNDFOS

Technical Data 300 GPM Model 300S

DIMENSIONS AND WEIGHTS

MODEL NO.	FIG.	HP	MOTOR SIZE	DISCH. SIZE	DIMENSIONS IN INCHES A	B	C	D	E	APPROX. SHIP WT.
300S75-2	A	7 1/2	4"	3" NPT	48.0	29.6	19.5	5.4	5.7	104
300S150-3	A	15	6"	3" NPT	51.9	28.0	23.9	5.4	5.7	170
300S150-4	A	15	6"	3" NPT	56.4	28.0	28.4	5.4	5.7	177
300S200-5	A	20	6"	3" NPT	63.4	30.6	32.8	5.4	5.7	197
300S250-6	A	25	6"	3" NPT	70.4	33.1	37.3	5.4	5.7	214
300S300-7	A	30	6"	3" NPT	77.4	35.7	41.7	5.4	5.7	220
300S300-8	A	30	6"	4" NPT	81.9	35.7	46.2	5.4	5.7	241
300S400-9*	A	40	6"	4" NPT	91.4	40.8	50.6	5.4	5.7	281
300S400-10*	A	40	6"	4" NPT	95.9	40.8	55.1	5.4	5.7	286
300S500-11*	A	50	6"	4" NPT	97.8	57.8	59.5	5.4	5.7	292
300S500-12*	A	50	6"	4" NPT	116.8	57.8	83.9	5.4	5.7	396
300S500-13*	A	50	6"	4" NPT	126.2	57.8	68.4	5.4	5.7	402
300S600-14*	A	60	8"	4" NPT	115.8	41.8	74.0	7.5	7.1	447
300S600-15*	A	60	8"	4" NPT	120.3	41.8	78.5	7.5	7.1	484
300S750-16	A	75	8"	4" NPT	130.3	47.4	82.9	7.5	7.1	540
300S750-17	A	75	8"	4" NPT	134.8	47.4	87.4	7.5	7.1	544
300S750-18	A	75	8"	4" NPT	139.2	47.4	91.8	7.5	7.1	826

NOTES. Models 2-13 Stgs. are suitable for use in 6" wells. 14-18 Stgs. are suitable for use in 8" wells
Weights include pump end with motor in lbs
* Alternate motor sizes available

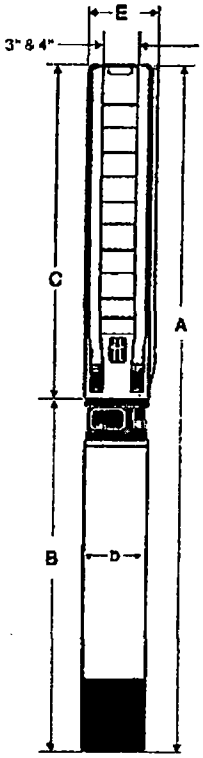
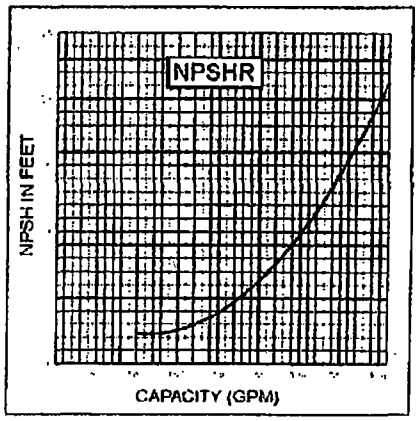


Fig A

MATERIALS OF CONSTRUCTION

COMPONENT	CYLINDRICAL SHAFT (2-18 Stgs.)
Check Valve Housing	304 Stainless Steel
Check Valve	304 Stainless Steel
Diffuser Chamber	304 Stainless Steel
Split Cone Nut	304 Stainless Steel
Split Cone	304 Stainless Steel
Impeller	304 Stainless Steel
Suction Interconnector	304 Stainless Steel
Inlet Screen	304 Stainless Steel
Straps	304 Stainless Steel
Cable Guard	304 Stainless Steel
Coupling	329/416 Stainless Steel
Coupling Key	302/304 Stainless Steel
Pump Shaft	431 Stainless Steel
Intermediate Bearings	NBR
Impeller Seal Ring	NBR/304 Stainless Steel
Check Valve Seat	NBR/316 Stainless Steel
Top/Lower Bearing	NBR/316 Stainless Steel
8" Motor Adaptor Plate	304 Stainless Steel
Upthrust Washer	Carbon/Graphite HY22
Upthrust stop ring	304 S.S./Tungsten Carbide

NOTES: Specifications are subject to change without notice.



GRUNDFOS
GRUNDFOS PUMPS CORPORATION • 3131 N. Business Park Avenue • Fresno CA • 93727
Customer Service Centers: Allentown, PA • Fresno CA
Phone (800) 333-1366 • FAX (800) 333-1363
Canada: Oakville, Ontario • Mexico: Apodaca, N.L.

Appendix D. DWV Pipe Specifications and Literature

JM Eagle *Building essentials for a better tomorrow*™

SOLVENT WELD

[illegible] SHEET

PERFORATED UNDERDRAIN PIPE : :

JM EAGLE™ PVC ASTM D3034 SOLVENT WELD SDR35 SEWER PIPE

JM EAGLE™ SOLVENT WELD SEWER PIPE CONFORMS TO SPECIFICATIONS PRIOR TO PERFORATION AND CELL CLASS 12454 OR 12364 AS DEFINED IN ASTM D1784

NOM. PIPE SIZE (IN)	O.D. (IN)	NOM. I.D. (IN)	MIN T. (IN)	APPROX. WEIGHT (LBS/FT)
4"	4.215	3.961	0.120	1.022
4" x 10' Perf	4.215	3.961	0.120	1.022
6"	6.275	5.893	0.180	2.285
6" x 10' Perf	6.275	5.893	0.180	2.285

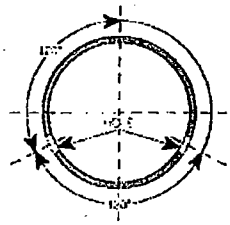
Standard Color: Green. Standard length: 10' or 20' Overall, Belled End Only
. Standard perforations for pipe are two rows of holes 1/2" in diameter on 5" centers and 120° angle apart.
Perforated pipe does not have ASTM designation on print line.

When using JM Eagle™ PVC ASTM D3034 Solvent Weld Sewer Pipe for septic tank fields, please install in accordance with ASTM D2321, and JM Eagle™ Publication JME-05B, "Gravity Sewer Installation Guide."

JM EAGLE™ PVC ASTM D2729 SOLVENT WELD DRAIN PIPE

JM EAGLE™ SOLVENT WELD DRAIN PIPE CONFORMS TO SPECIFICATIONS AND CELL CLASS 12454 OR 12364 AS DEFINED IN ASTM D1784

NOM. PIPE SIZE (IN)	O.D. (IN)	NOM. I.D. (IN)	MIN T. (IN)	APPROX. WEIGHT (LBS/FT)
3" Solid	3.250	3.102	0.070	0.465
3" Perf	3.250	3.102	0.070	0.465
4" Solid	4.215	4.056	0.075	0.648
4" Perf	4.215	4.056	0.075	0.648
6" Solid	6.275	6.063	0.100	1.300
6" Perf	6.275	6.063	0.100	1.300



. Standard Color: White. Standard length: 10' Overall, Belled End Only
. Standard perforations for pipe are two rows of holes 1/2" in diameter on 5" centers and 120° angle apart
Three perforation rows may be available.

When using JM Eagle™ PVC ASTM D2729 Solvent Weld Drain Pipe for septic tank fields, please install in accordance with ASTM F481, and JM Eagle™ Publication JME-05B, "Gravity Sewer Installation Guide."

* Prior to ordering or specifying, please consult JM Eagle™ for product and/or listing availability.
I.D. : Inside Diameter
O.D. : Outside Diameter
T : Wall Thickness

Appendix E. Hexa Armor Specifications and Literature

Hexa Armor™ / Rhombo cover specification sheet
(www.awtti.com)

AWTT INC.

Technical information

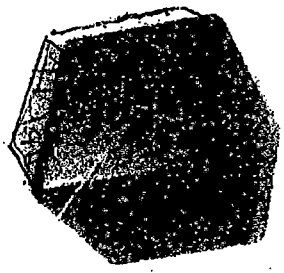
Hexa Armor™ (Rhombo) is made of virgin or recycled, high density polyethylene HDPE. Hexa Armor™ balls are widely used for all external applications due to their particular resistance to freezing and high wind conditions. The degrading effects of sunlight are prevented with UV stabilizing additives. HDPE is recommended for most applications including demineralized water and Chromic acid applications. FDA [1] and NSF approved HDPE resins available for special applications.

Description	Hollow reinforce multi-faceted ball
Construction	100% homogenous shell
Diameter	100 mm (4.5 inches)
Average weight	65 g
Number per sq.ft	10
Number per square meter	116
Wind Resistant up to (1)	75 MPH (120 km/h)
Operating Temperature range (1)	-50°C / + 95 °C
Coverage (up to)	99.99%
Evaporation Reduction (up to)	96%
Expected life expectancy	25+ years

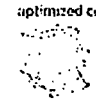
Resin & Ballast Properties (1)(2)

Shell material	High Density Blow Molding polyethylene
Melt Flow Index (190°C/2.16 kg)	0.35
Density	0.955
Melting Point, °F	264
Tensile Strength (PSI)	4000
Elongation at Break, %	600
Flexure Modulus (PSI)	200,000

(1) Data developed under laboratory conditions
Some of the data listed was determined on compression molded specimens and may, therefore, vary from [illegible] articles.
Complies with FDA 22 CFR § 177.1520, Para. [illegible]



Proprietary (patent pending) ball faceted shape for optimized coverage



Symmetrical on all side for [illegible] coverage

Large flat faces for optimum wind resistance (NO stacking / NO overlapping)

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1200 GPM ZEOLITE SYSTEM CONSTRUCTION PLANS

Sheet Number	Drawing Title
1	General System Layout
2	Major Piping Schematic
3	General Traffic Pattern
4	Approximate Early 2015 Topography in the Zeolite System Area
5	Local Avoidance and Staging Areas
6	Cross Section Location Map
7	Cross Sections Through Cells - Cross Sections A-A' Through D-D'
8	Cross Sections Through Cells - Cross Sections E-E' Through I-I'
9	Perimeter Berm and Liner Anchor Trench Details
10	Interior Berm Liner Installation
11	Water Treatment Piping With Top of Liner Surface
12	Water Supply Detail #1 - Water Treatment Piping With Top of Liner Surface
13	Water Supply Detail #2 - Water Treatment Piping With Top of Liner Surface
14	Water Supply Detail #3 - Water Treatment Piping With Top of Liner Surface
15	Water Supply Detail #4 - Water Treatment Piping With Top of Liner Surface
16	Water Supply Detail #5 - Water Treatment Piping With Top of Liner Surface
17	Zeolite System Cell Distribution Piping With Top of Liner Surface and Regen Discharge System
18	North Cell Distribution Piping With Top of Liner Surface and Regen Discharge System
19	South Cell Distribution Piping With Top of Liner Surface and Regen Discharge System
20	Distribution Detail #1 - Cell Distribution Piping With Top of Liner Surface and Regen Discharge System
21	Distribution Detail #2 - Cell Distribution Piping With Top of Liner Surface and Regen Discharge System
22	Cell Water Transfer Piping
23	Cell Water Transfer Trench and Piping
24	Cell Water Supply, Treated Water Discharge and Regen Pumping Cross Section Details
25	Zeolite System Supply Manifold
26	Regen Pumping System and Water Distribution System Details
27	Shower Building Details
28	Tank Installation and Anchorage Detail
29	Zeolite System Emergency Spillway
30	Electrical Supply System and Electronic Control System Schematic
31	Pipe Outslope Envelope, Anchor Block and Pipe Corridor Details
32	Pipe Outslope Envelope
33	Booster Station Manifold and Treated Water Manifold
34	Treatment Supply and Injection Supply Pipe Manifold
35	Pipe Corridor Section Diagrams Section A through D
36	Pipe Corridor Section Diagrams Section E through H
37	Pipe Corridor Section Diagram Section H
38	Pipe Corridor Section Diagram Section D
39	Cell Supply Manifold Details
40	Cell #2 to Cell #3 Water Transfer Piping
41	Pipe Trench, Regen Discharge, and Wye Filter Details
42	Central Berm and Perimeter Road Configuration

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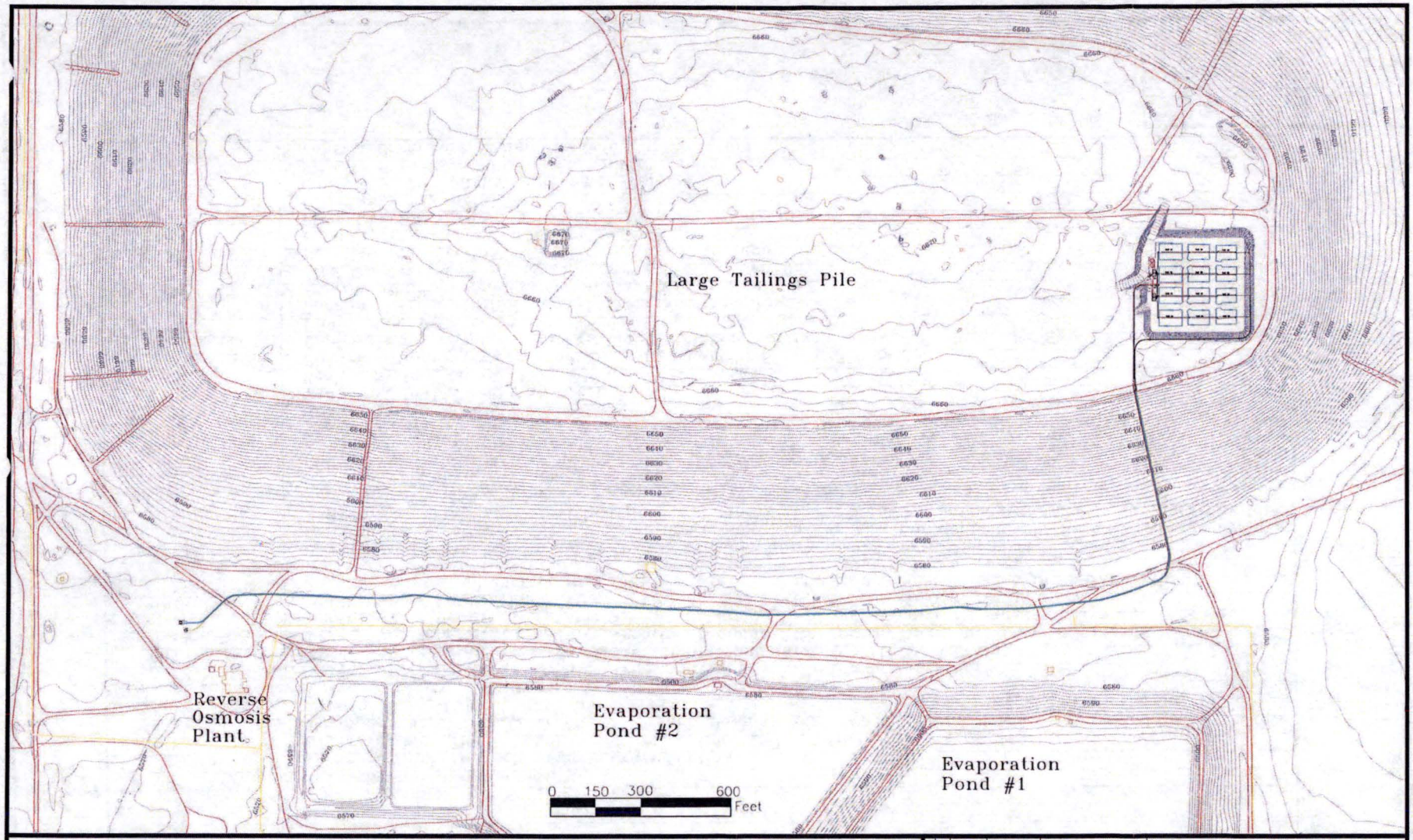
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Index Sheet



Legend

- Water Supply Pipe
- Cell Discharge Pipe
- Regen System Pipe
- Acid Supply Pipe
- Zeolite Level

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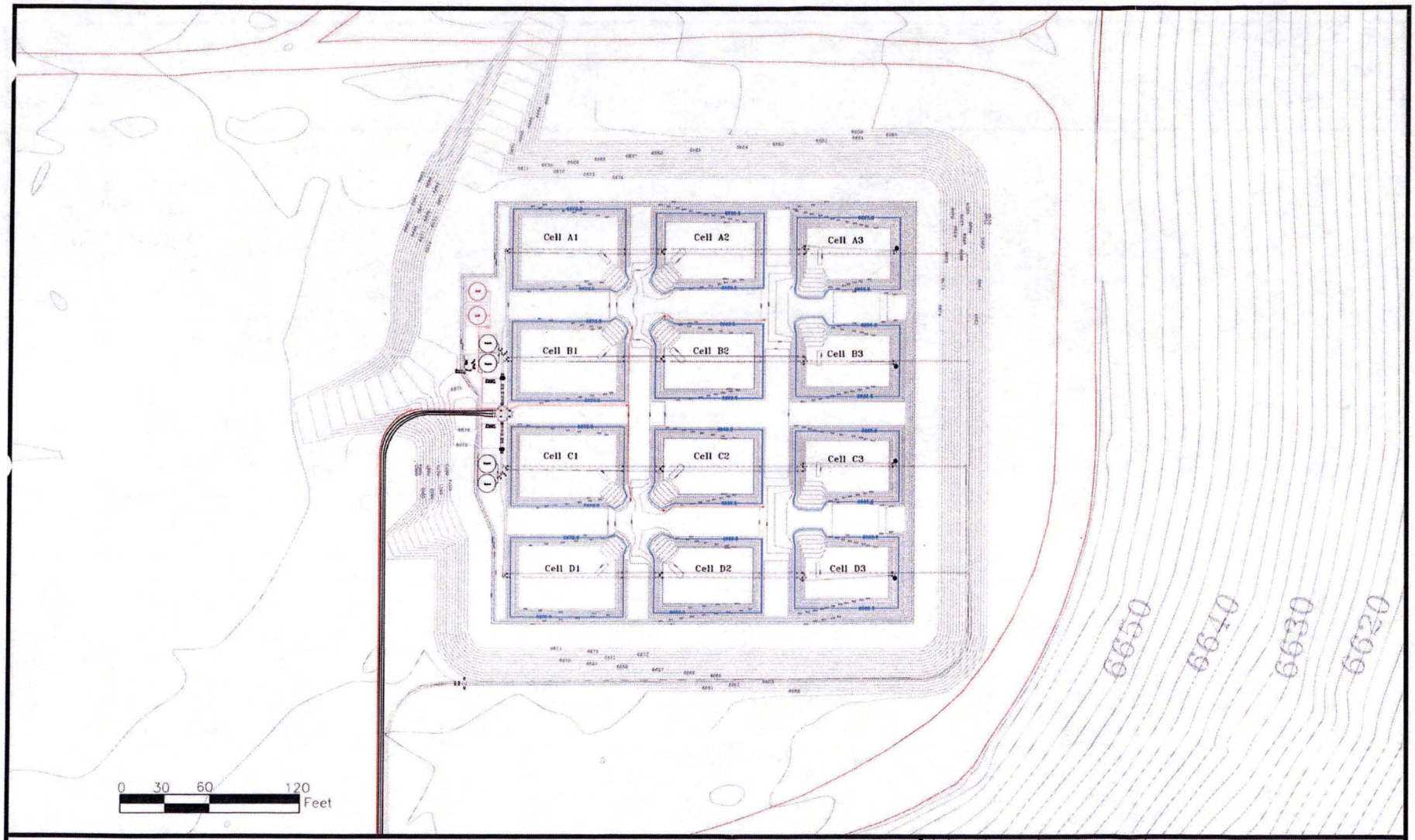
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

General System Layout

Sheet 1



Legend

- Water Supply Pipe
- Cell Discharge Pipe
- Regen System Pipe
- Acid Supply Pipe
- Zeolite Level

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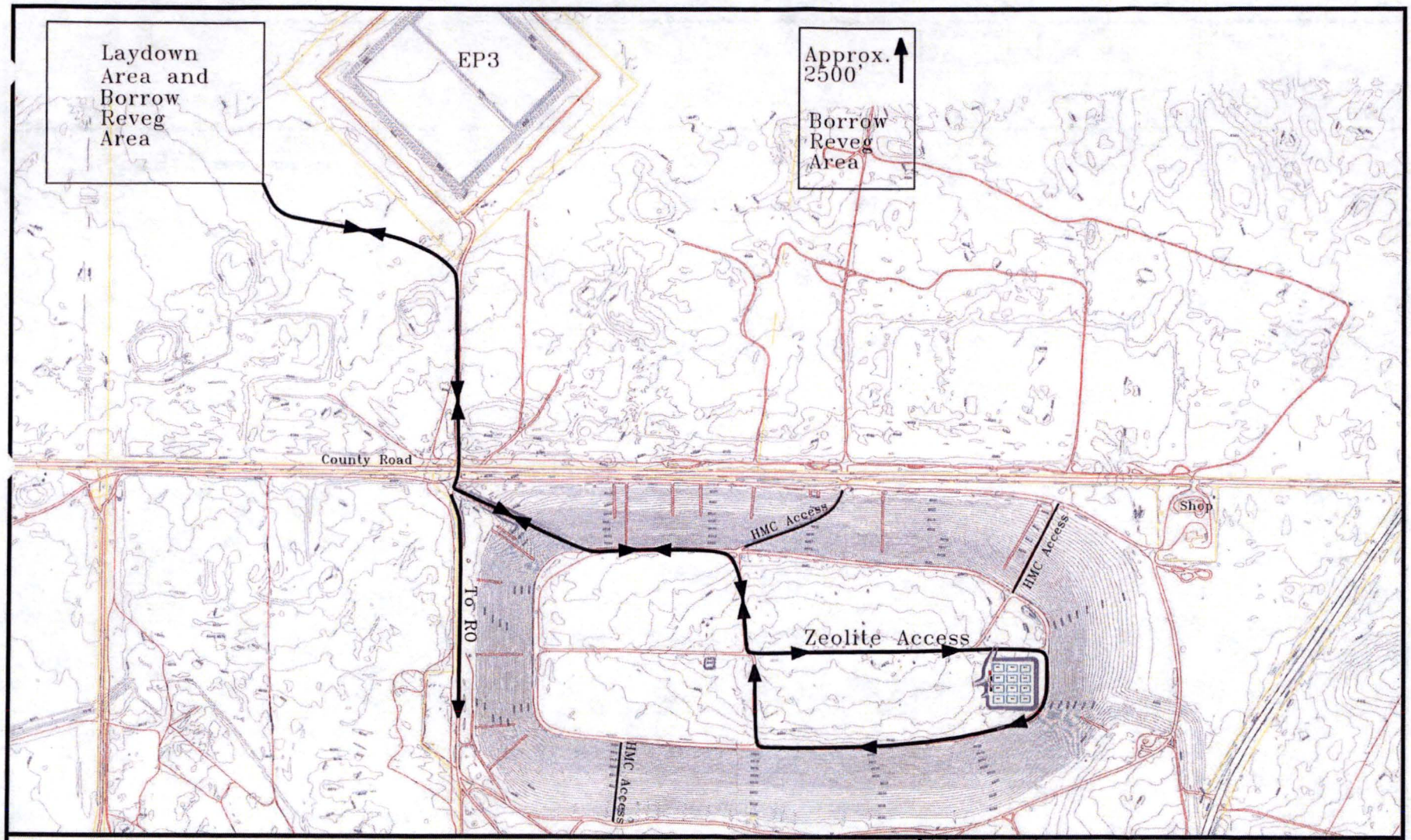
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Major Piping Schematic

Sheet 2



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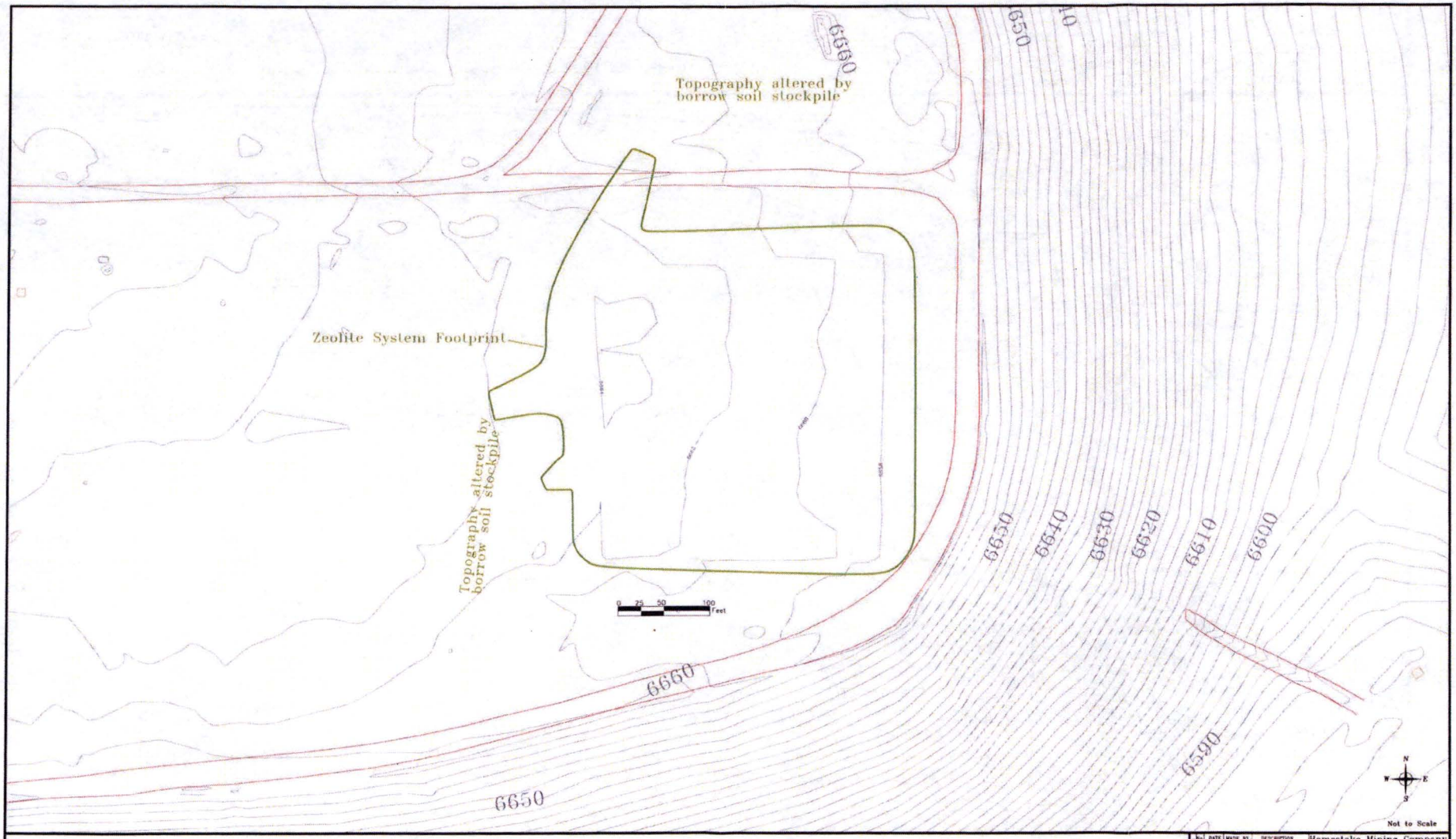
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

General Traffic Pattern

Sheet 3



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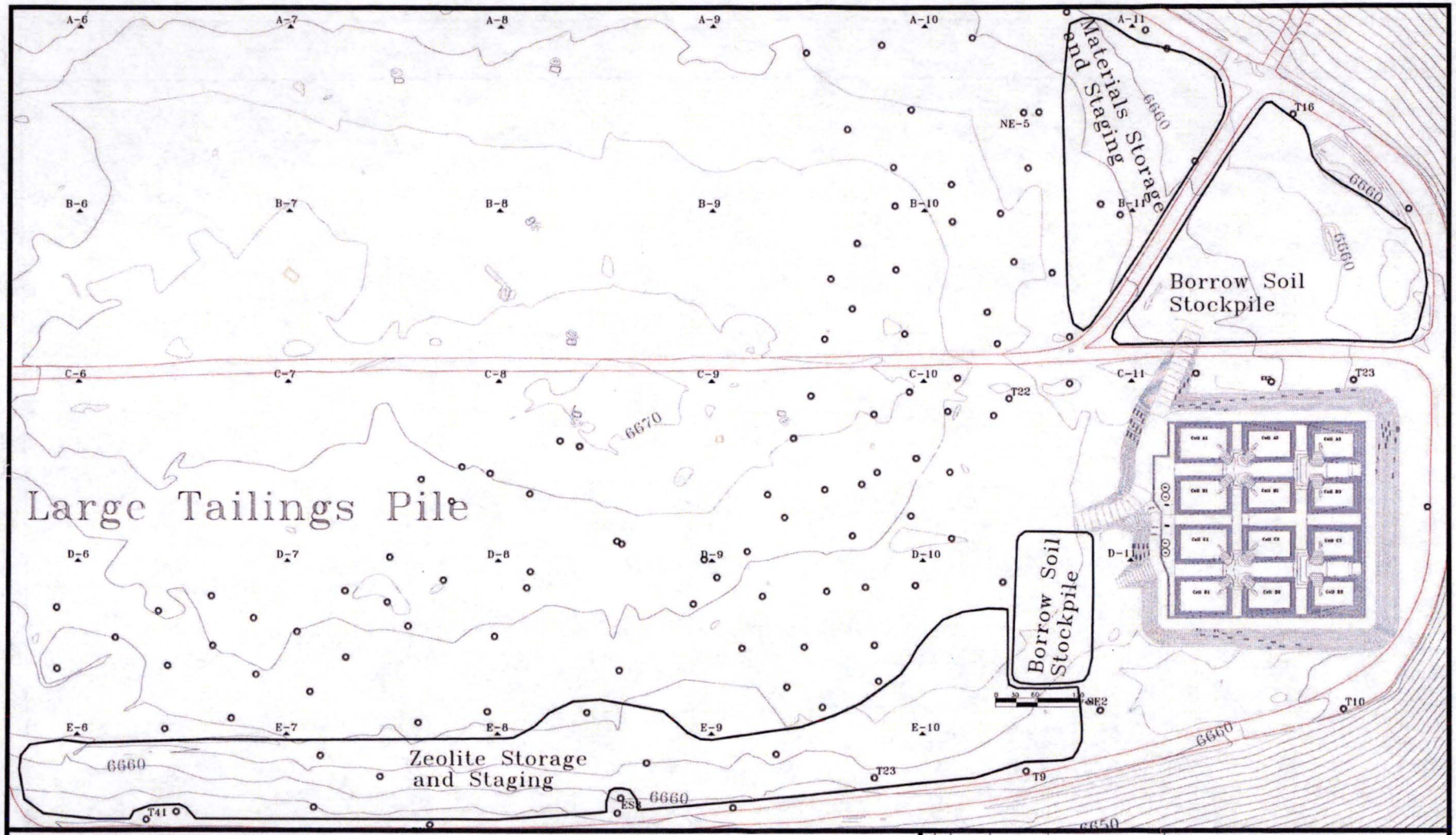
Homestake Mining Company
Gilpin Mine Mill
1200 GPM Zeolite System

Approximate Early 2015 Topography in the Zeolite System Area

Sheet 6



Legend

E-10 ▲ Settlement Monument (must avoid)

Well Location (must avoid)

Staging Area Boundary

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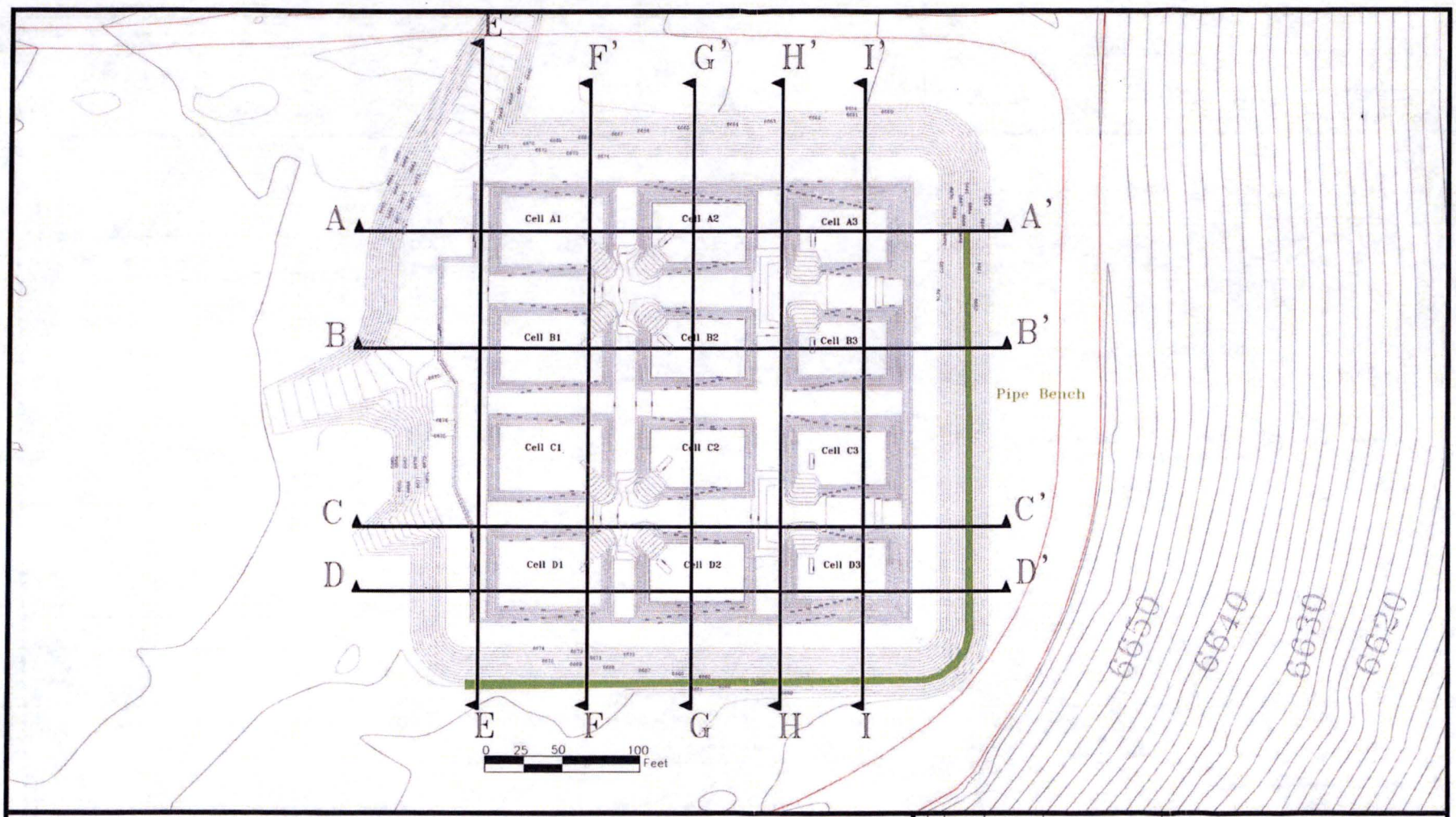
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Local Avoidance and Staging Areas

Sheet 5



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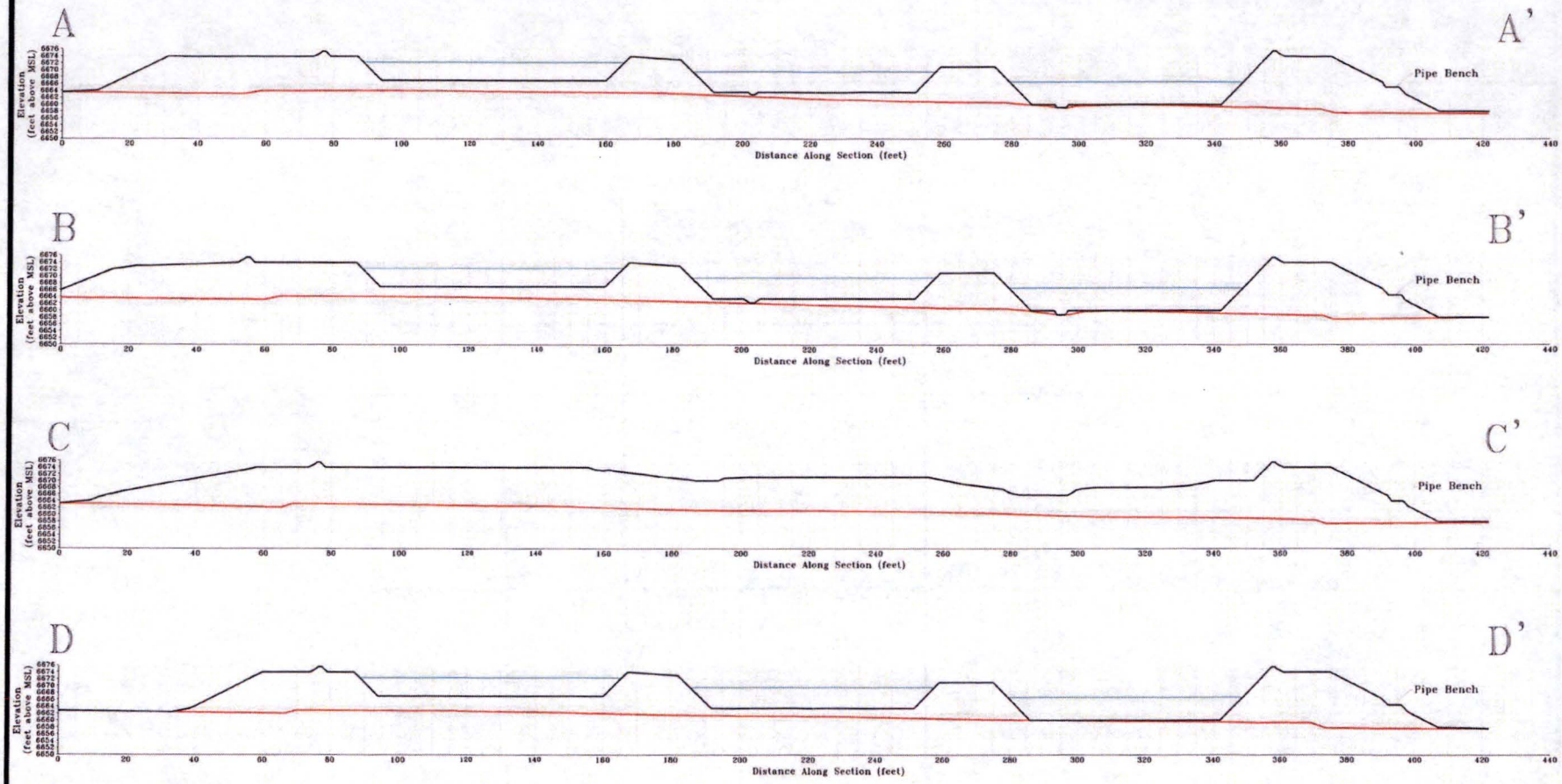
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Cross Section
Location Map

Sheet 6



Not to Scale

Legend

- Design Surface
- Approximate Preconstruction Land Surface
- Approximate Zeolite Level

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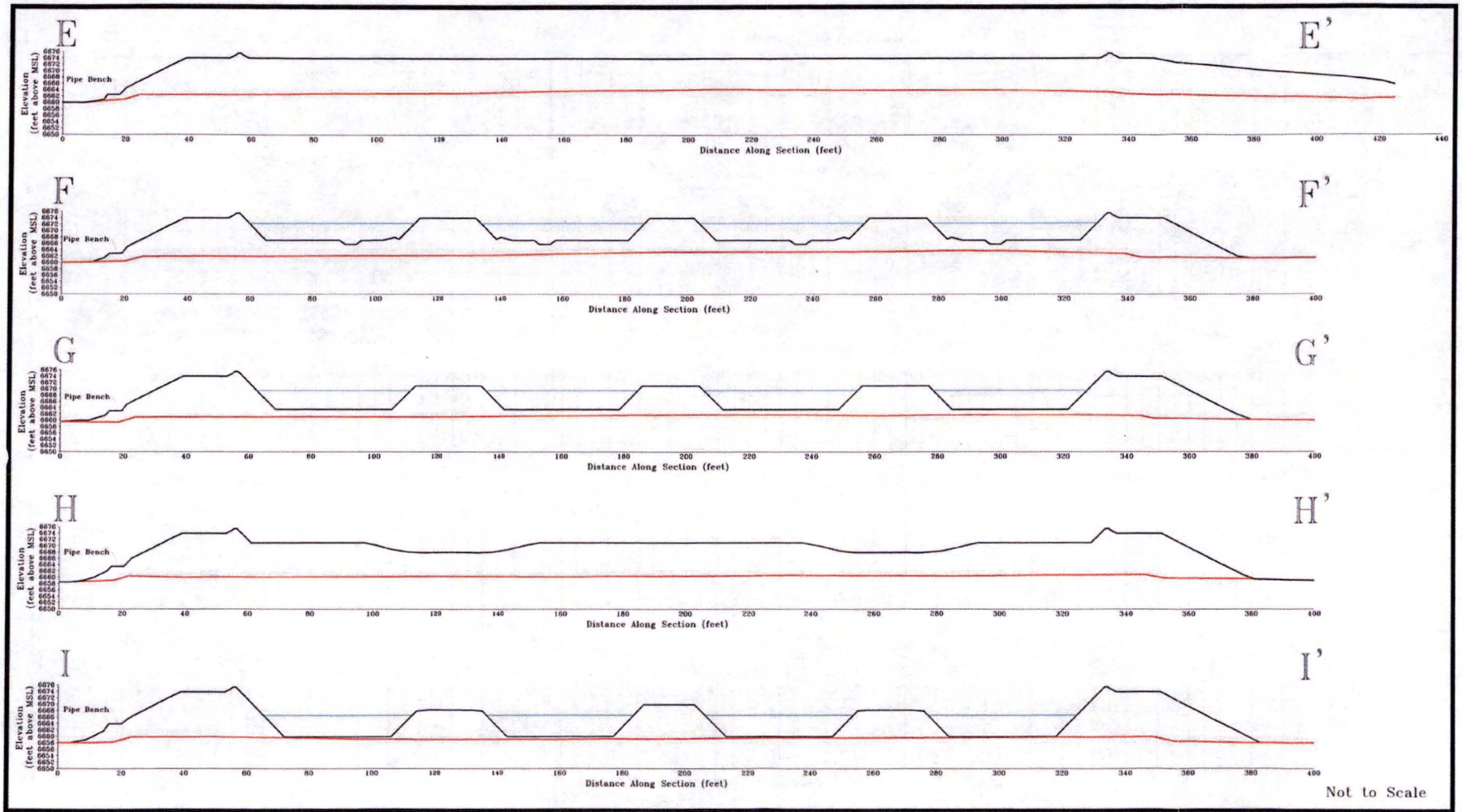
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Cross Sections Through Cells
Cross Sections A-A' Through D-D'

Sheet 7



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Legend

- Design Surface
- Approximate Preconstruction Land Surface
- Approximate Zeolite Level

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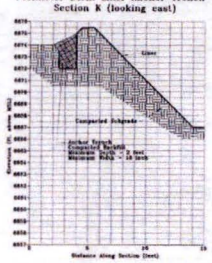
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Cross Sections Through Cells
Cross Sections E-E' Through I-I'

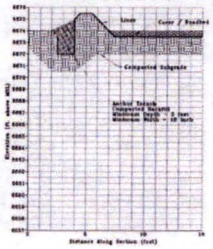
Sheet 8

Not to Scale

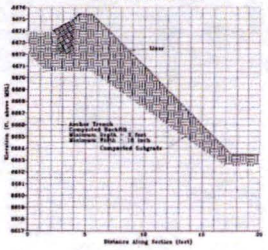
Perimeter Berm Liner Anchor Trench
Section K (looking east)



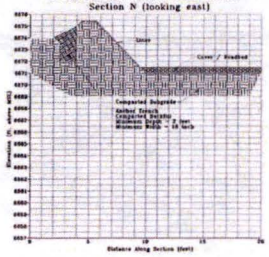
Perimeter Berm Liner Anchor Trench
Section L (looking east)



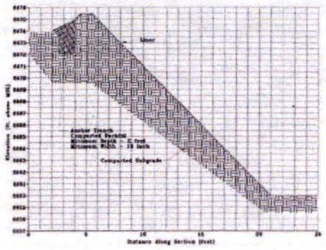
Perimeter Berm Liner Anchor Trench
Section M (looking east)



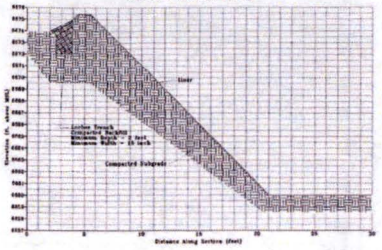
Perimeter Berm Liner Anchor Trench
Section N (looking east)



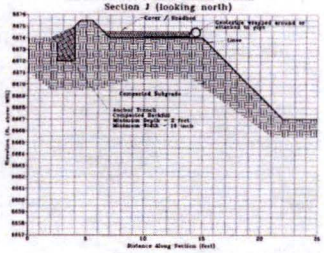
Perimeter Berm Liner Anchor Trench
Section O (looking east)



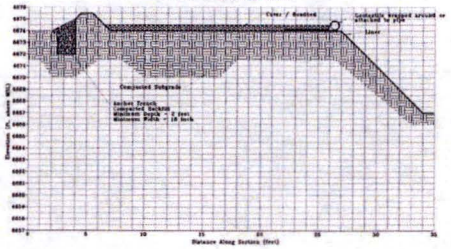
Perimeter Berm Liner Anchor Trench
Section P (looking south)

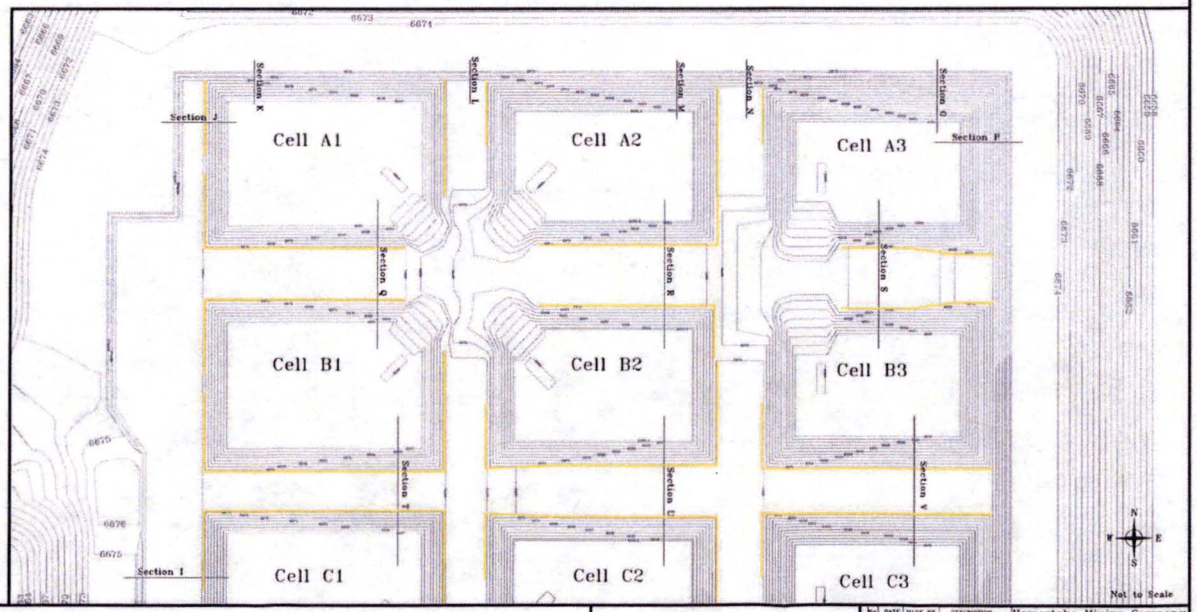


Perimeter Berm Liner Anchor Trench
Section J (looking north)



Perimeter Berm Liner Anchor Trench
Section I (looking north)





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Legend

- Section J — Cross Section location
- 6676 — Top of Liner or Surface Contours (1 foot Interval)
- Pipe Curb Location

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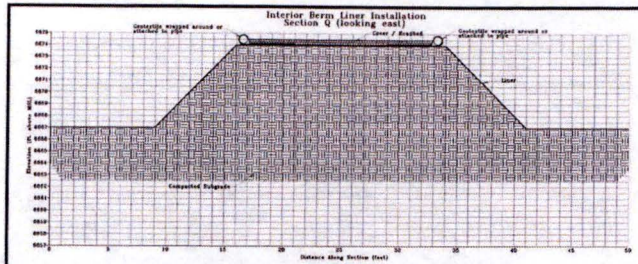
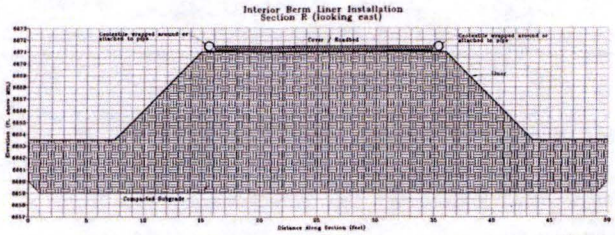
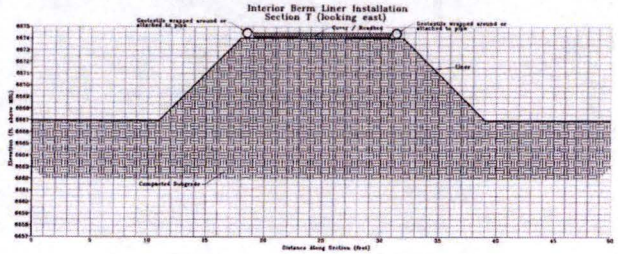
Homestake Mining Company
Grant Mine Mill
1000 NPR Facility Section

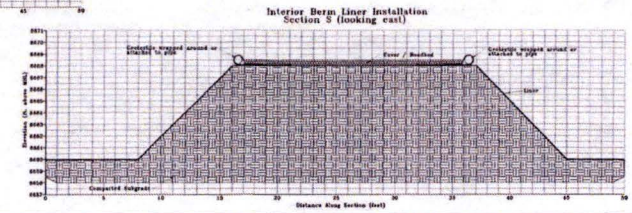
Perimeter Berm and Liner Anchor Trench Details

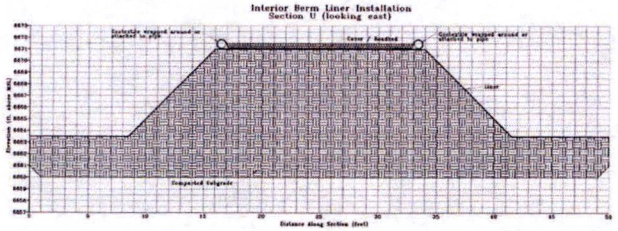
Sheet

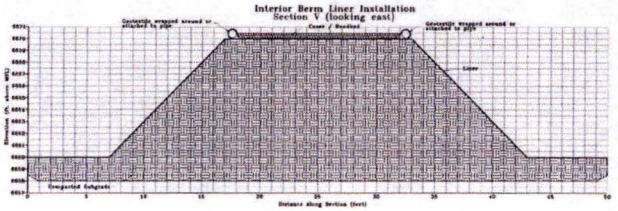


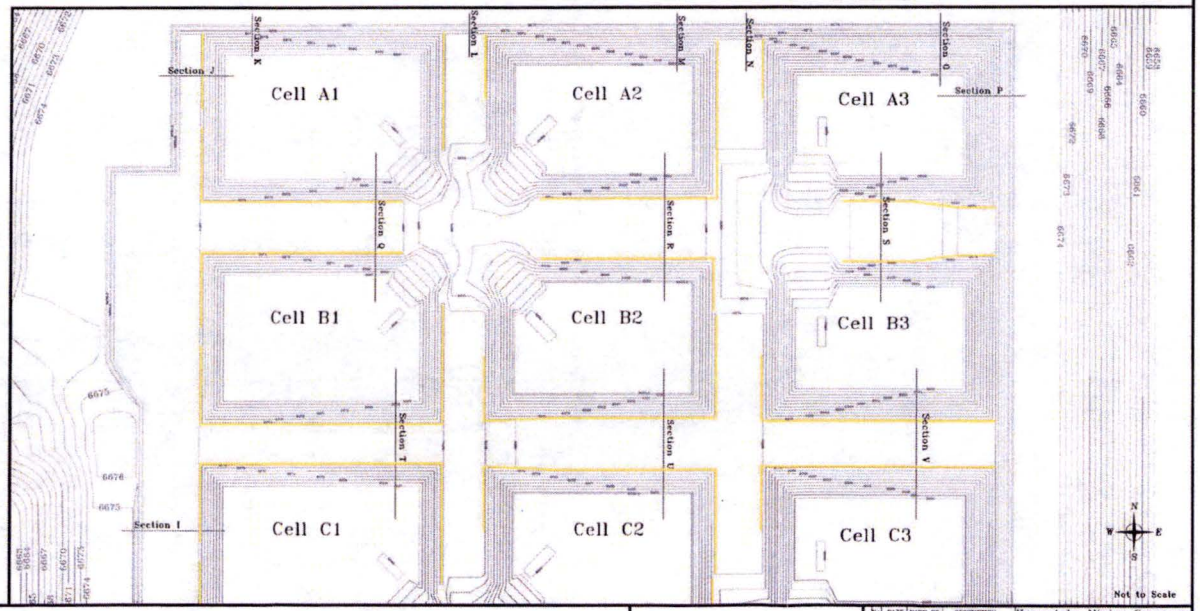












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Legend

- Cross Section Location
- Top of Liner or Surface Contours (1 foot interval)
- Pipe Curb Location

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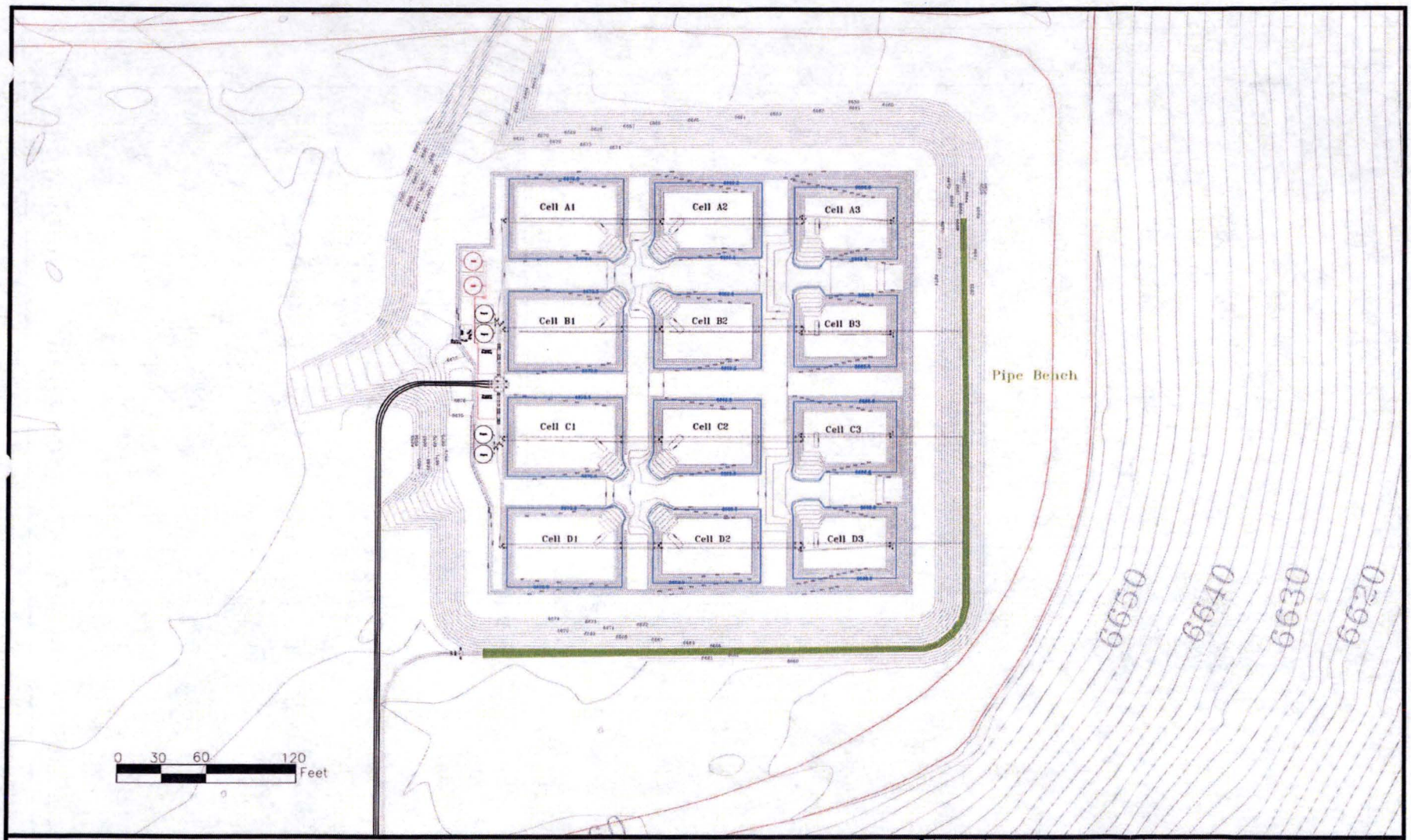
Homestake Mining Company
Grants New Mexico
1200 GPM Leachate System

Interior Berm Liner Installation

Sheet 16



Legend

- Top of Liner Contour
- Water Supply Plumbing
- Acid Supply Plumbing
- Zeolite Level
- Discharge Pipe Bench
- Regen — Regen Mixing Tank
- Acid — Acid Supply Tank
- Process Building

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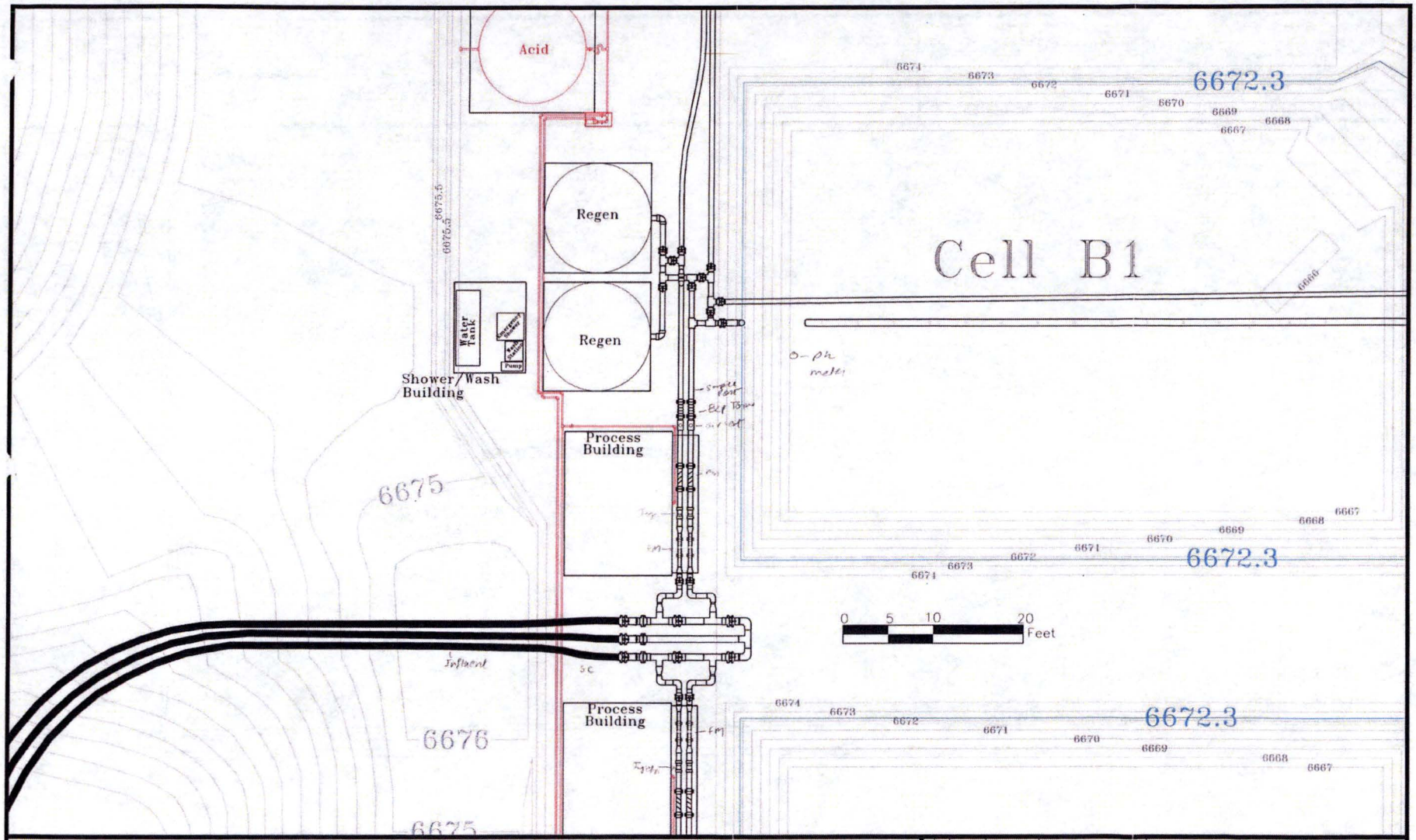
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Water Treatment Piping
With Top of Liner Surface

Sheet 11



Legend

- Top of Liner Contour
- Water Supply Plumbing
- Acid Supply Plumbing
- Zeolite Level
- Discharge Pipe Bench
- Regen — Regen Mixing Tank
- Acid — Acid Supply Tank
- Process Building

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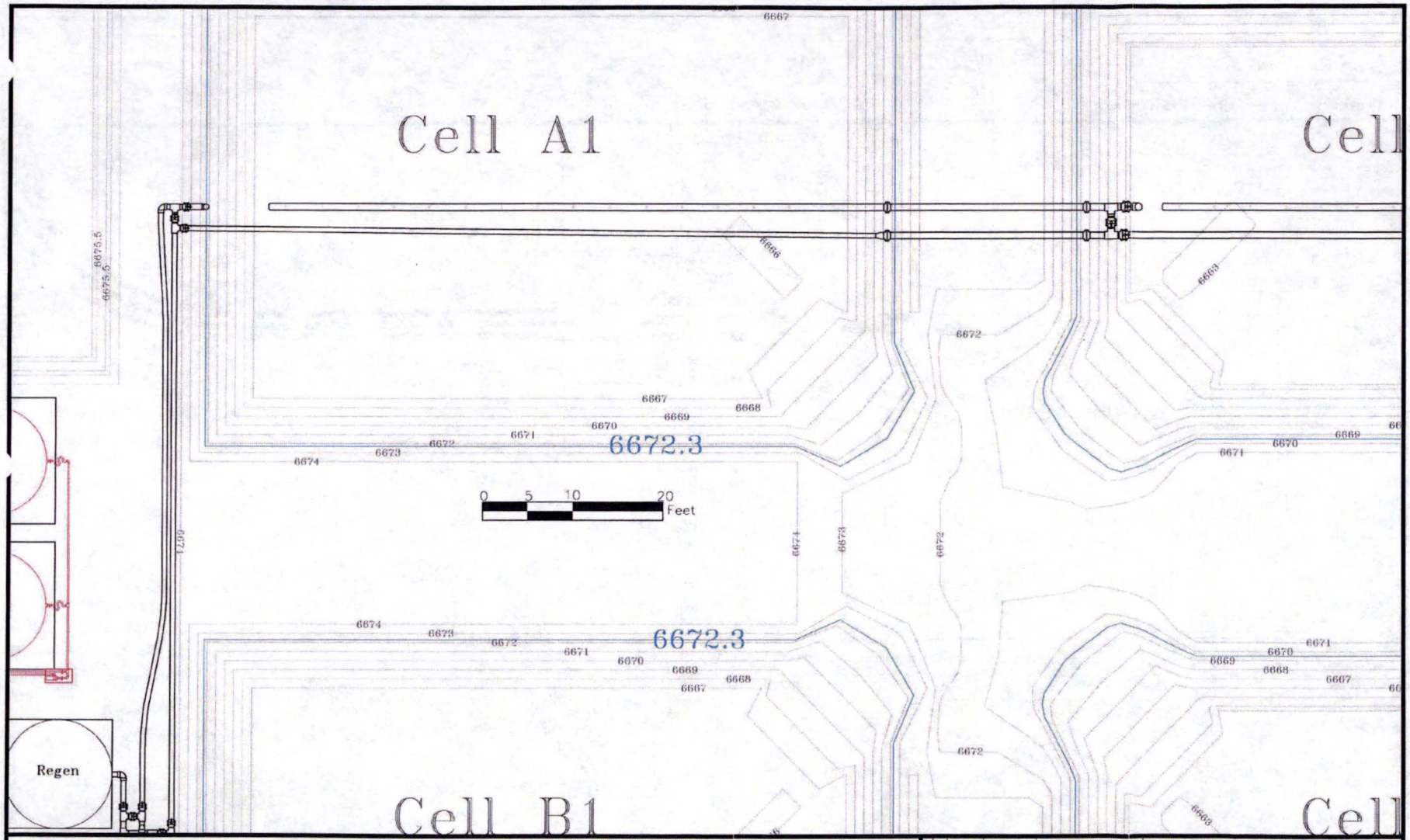
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Water Supply Detail #1
Water Treatment Piping
With Top of Liner Surface

Sheet 12



Legend

- Top of Liner Contour
- Water Supply Plumbing
- Acid Supply Plumbing
- Zeolite Level
- Discharge Pipe Bench
- Regen — Regen Mixing Tank
- Acid — Acid Supply Tank
- Process Building

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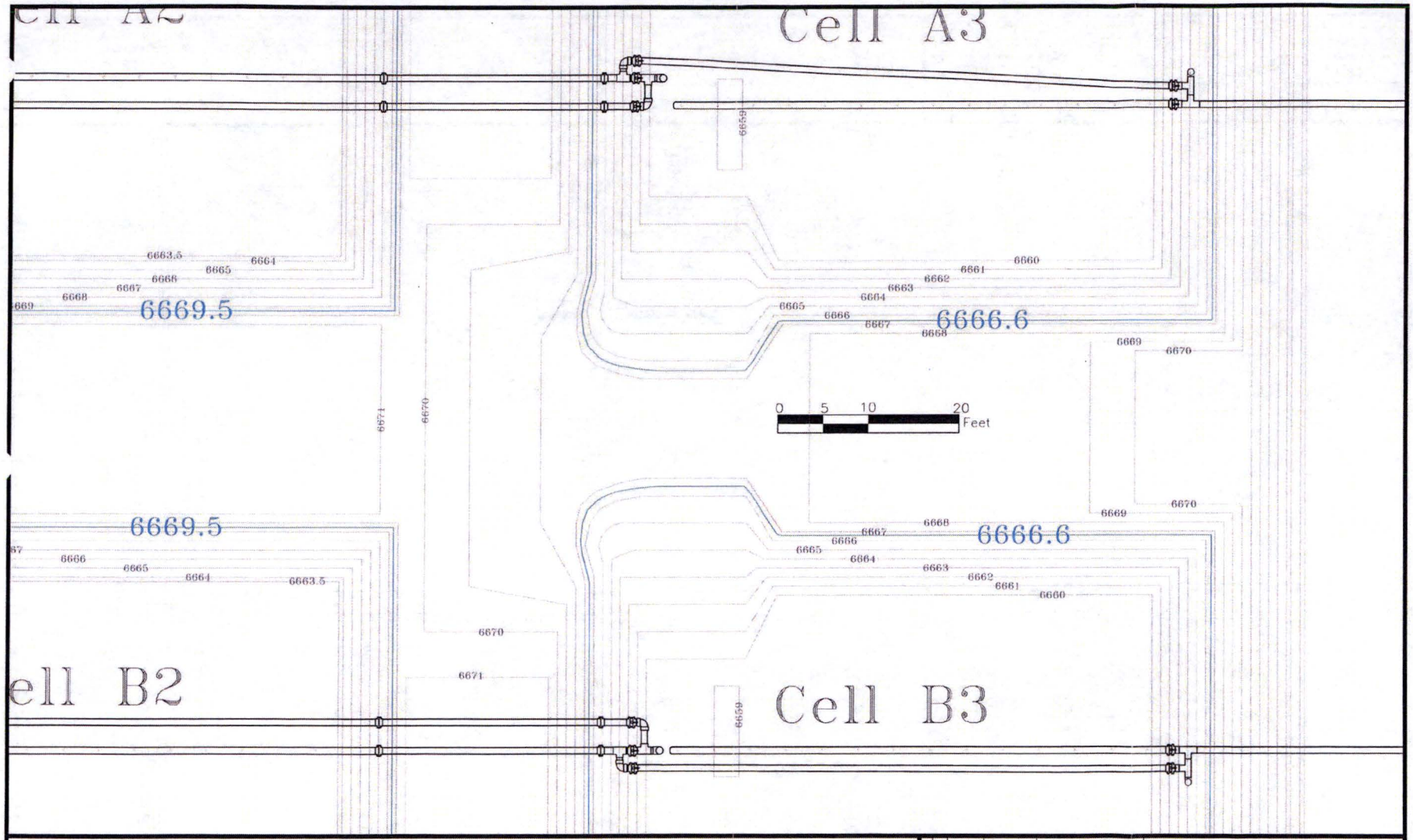
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Water Supply Detail #2
Water Treatment Piping
With Top of Liner Surface

Sheet 13



Legend

- Top of Liner Contour
- Water Supply Plumbing
- Acid Supply Plumbing
- Zeolite Level
- Discharge Pipe Bench
- Regen — Regen Mixing Tank
- Acid — Acid Supply Tank
- Process Building

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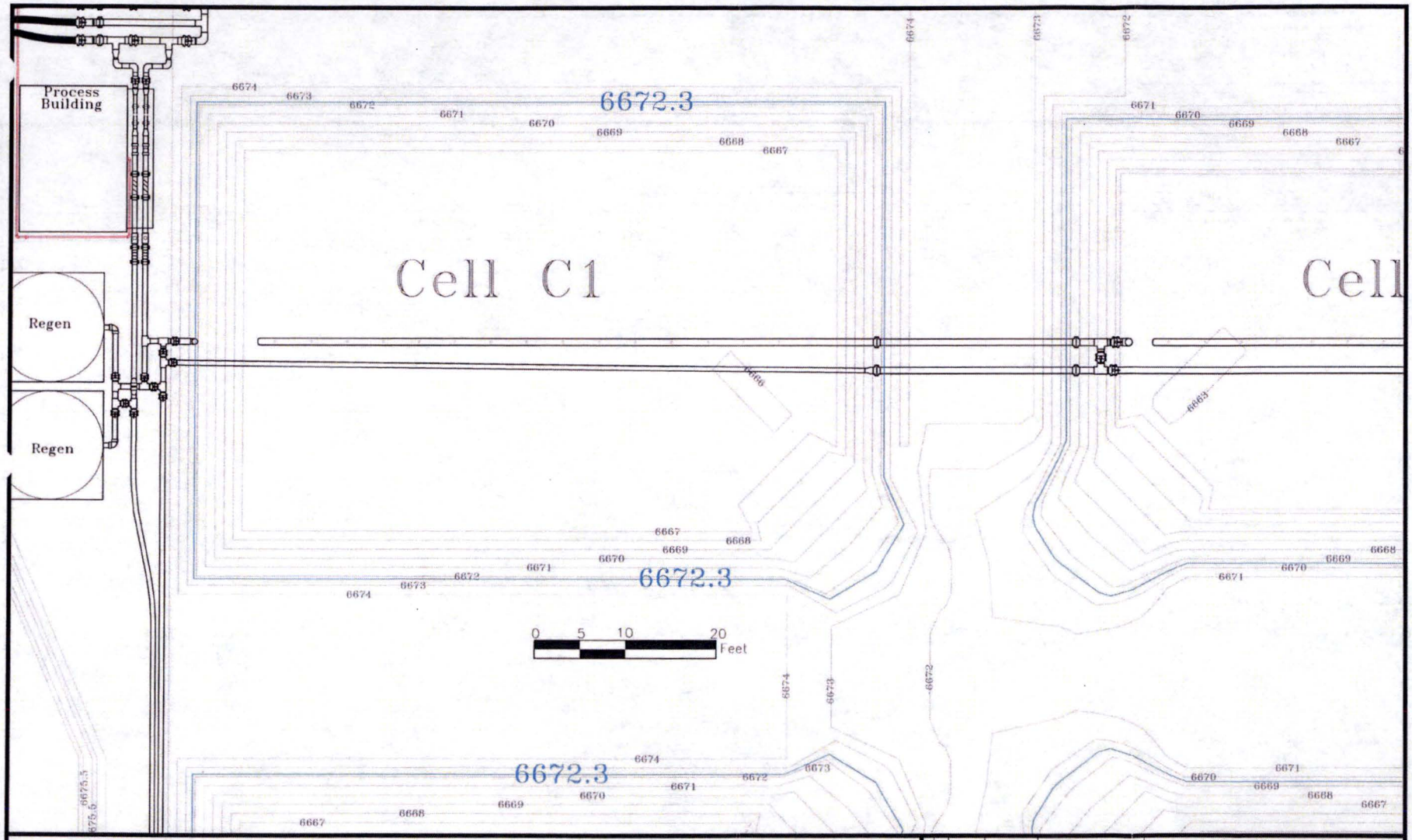
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Water Supply Detail #3
Water Treatment Piping
With Top of Liner Surface

Sheet 14



Legend

- Top of Liner Contour
- Water Supply Plumbing
- Acid Supply Plumbing
- Zeolite Level
- Discharge Pipe Bench
- Regen — Regen Mixing Tank
- Acid — Acid Supply Tank
- Process Building

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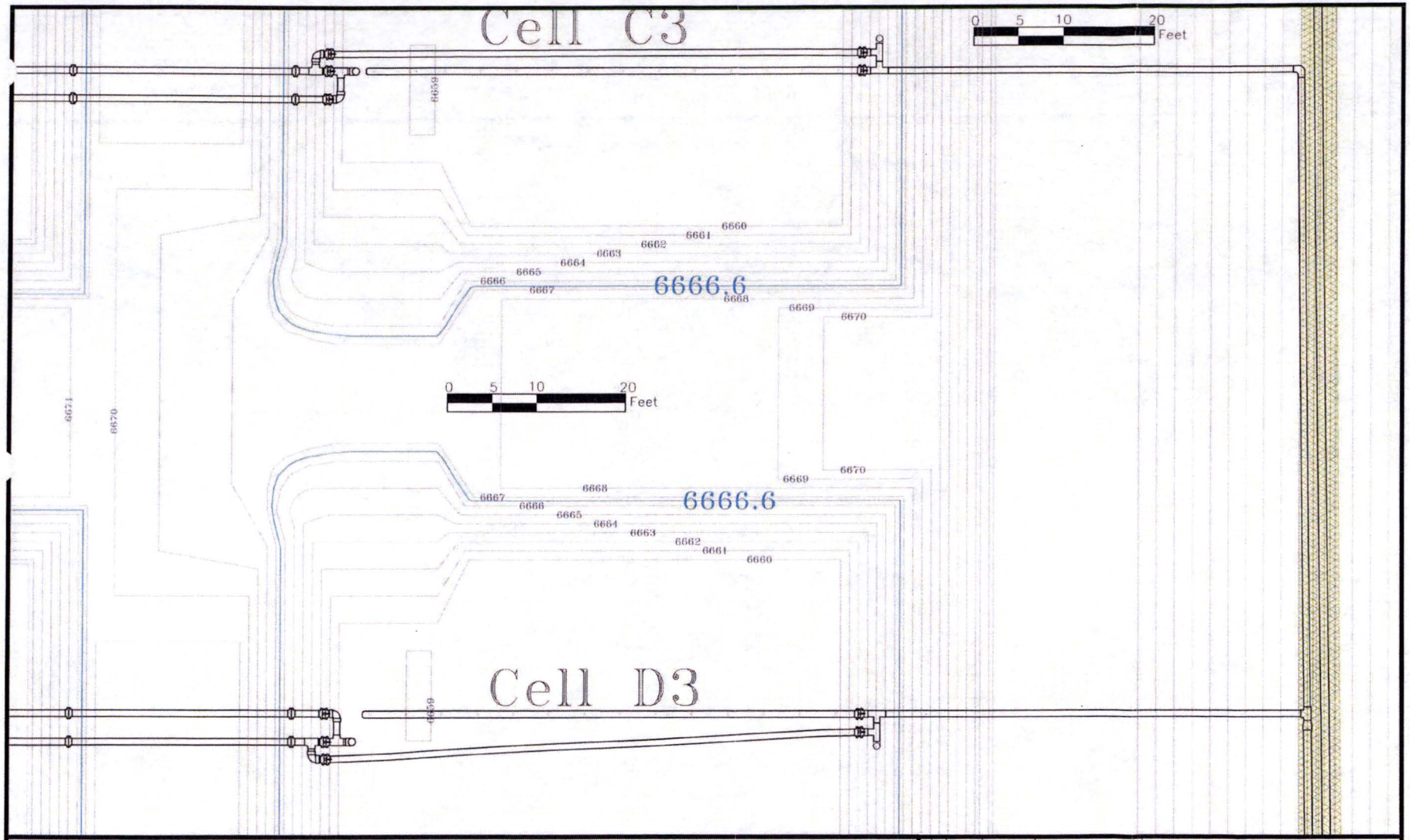
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Water Supply Detail #4
Water Treatment Piping
With Top of Liner Surface

Sheet 15



Legend

- Top of Liner Contour
- Water Supply Plumbing
- Acid Supply Plumbing
- Zeolite Level
- Discharge Pipe Bench
- Regen — Regen Mixing Tank
- Acid — Acid Supply Tank
- Process Building

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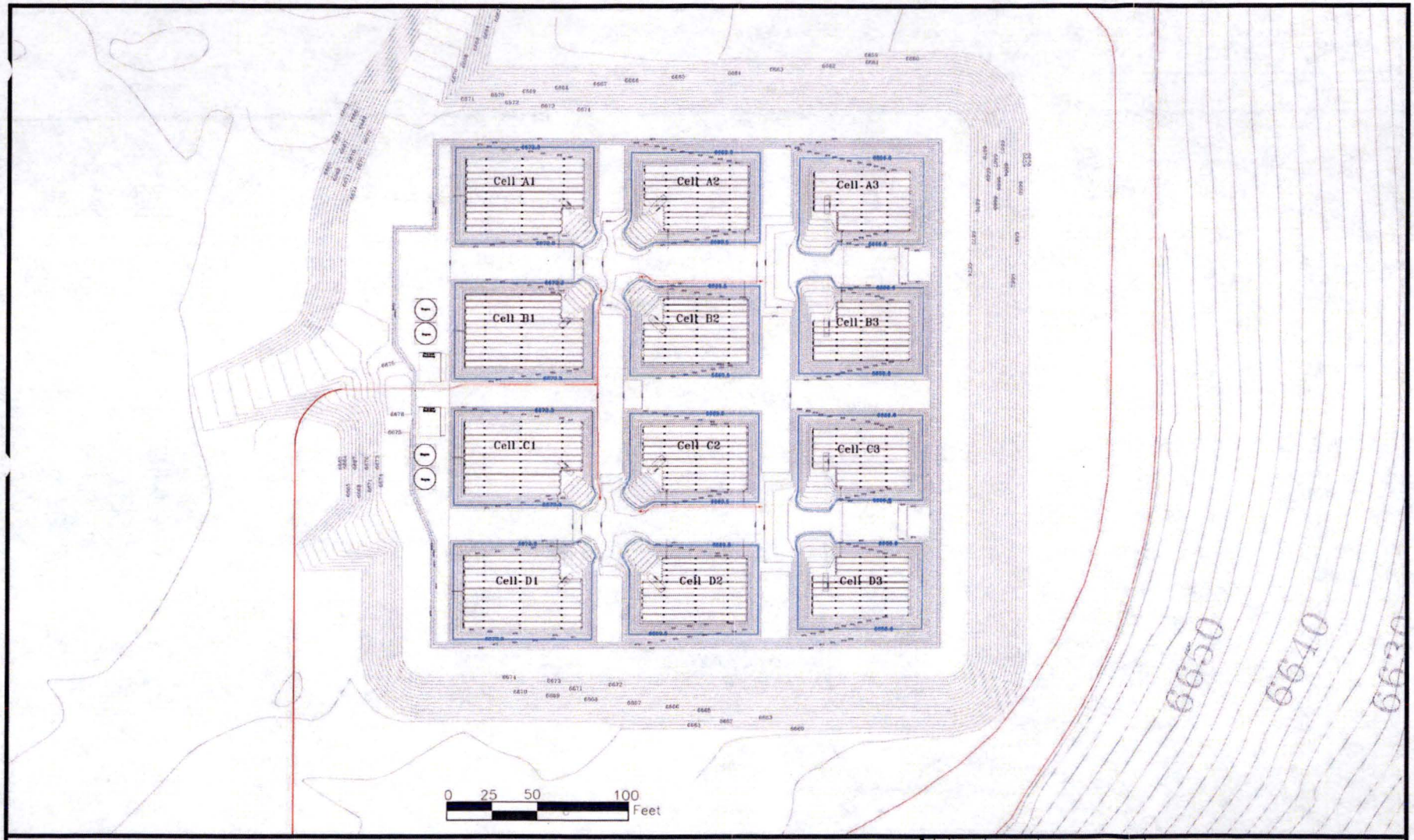
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Water Supply Detail #5
Water Treatment Piping
With Top of Liner Surface

Sheet 16



Legend

- Top of Liner or Surface Contour
- Water Distribution Plumbing
- Regen Pumping Plumbing
- Zeolite Level
- Regen Pump Access Pipe
- Regen — Regen Mixing Tank
- Process Building

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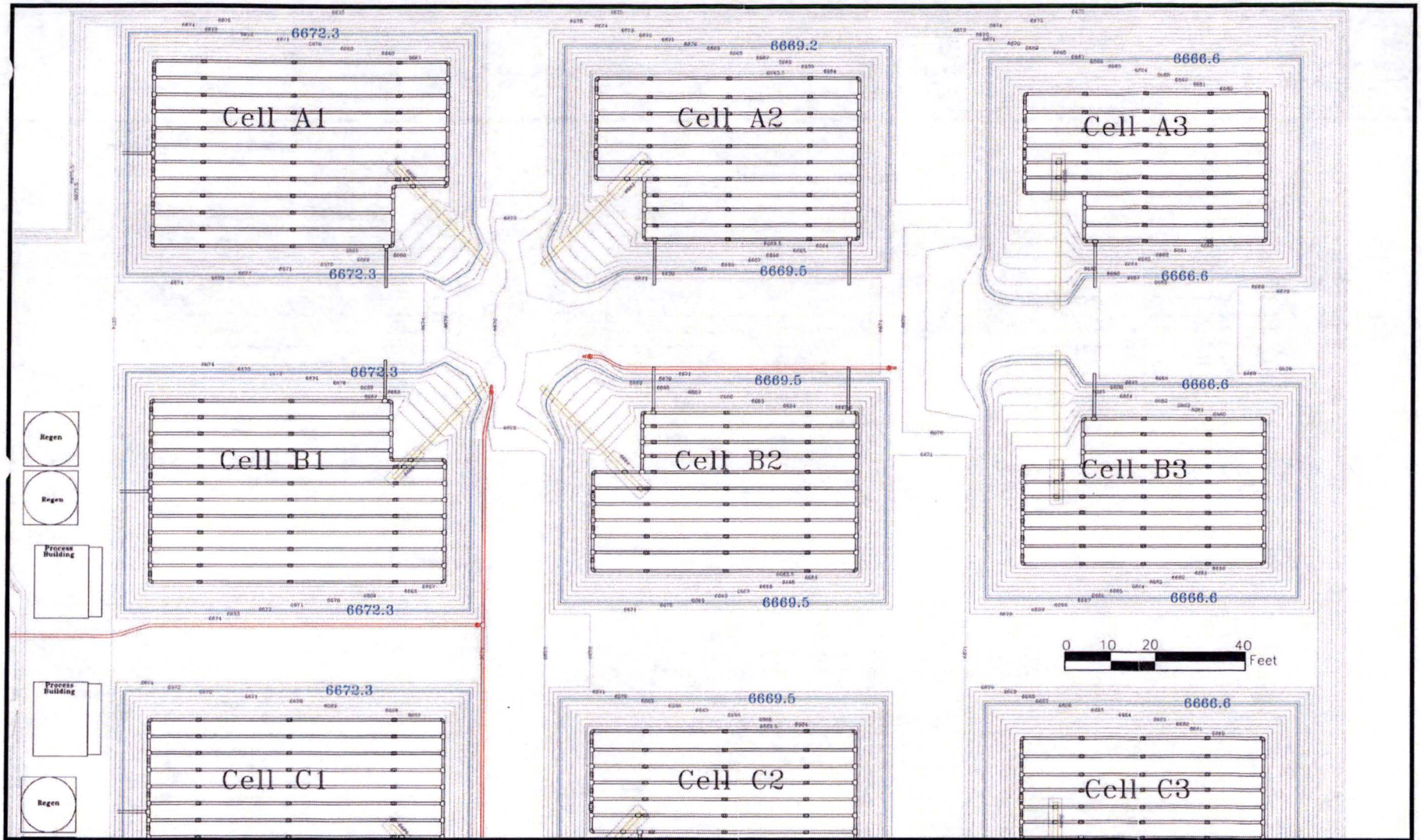
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Zeolite System Cell Distribution Piping With Top of Liner Surface And Regen Discharge System

Sheet 17



Legend

- Top of Liner or Surface Contour
- Water Distribution Plumbing
- Regen Pumping Plumbing
- Zeolite Level
- Regen Pump Access Pipe
- Regen — Regen Mixing Tank
- Process Building

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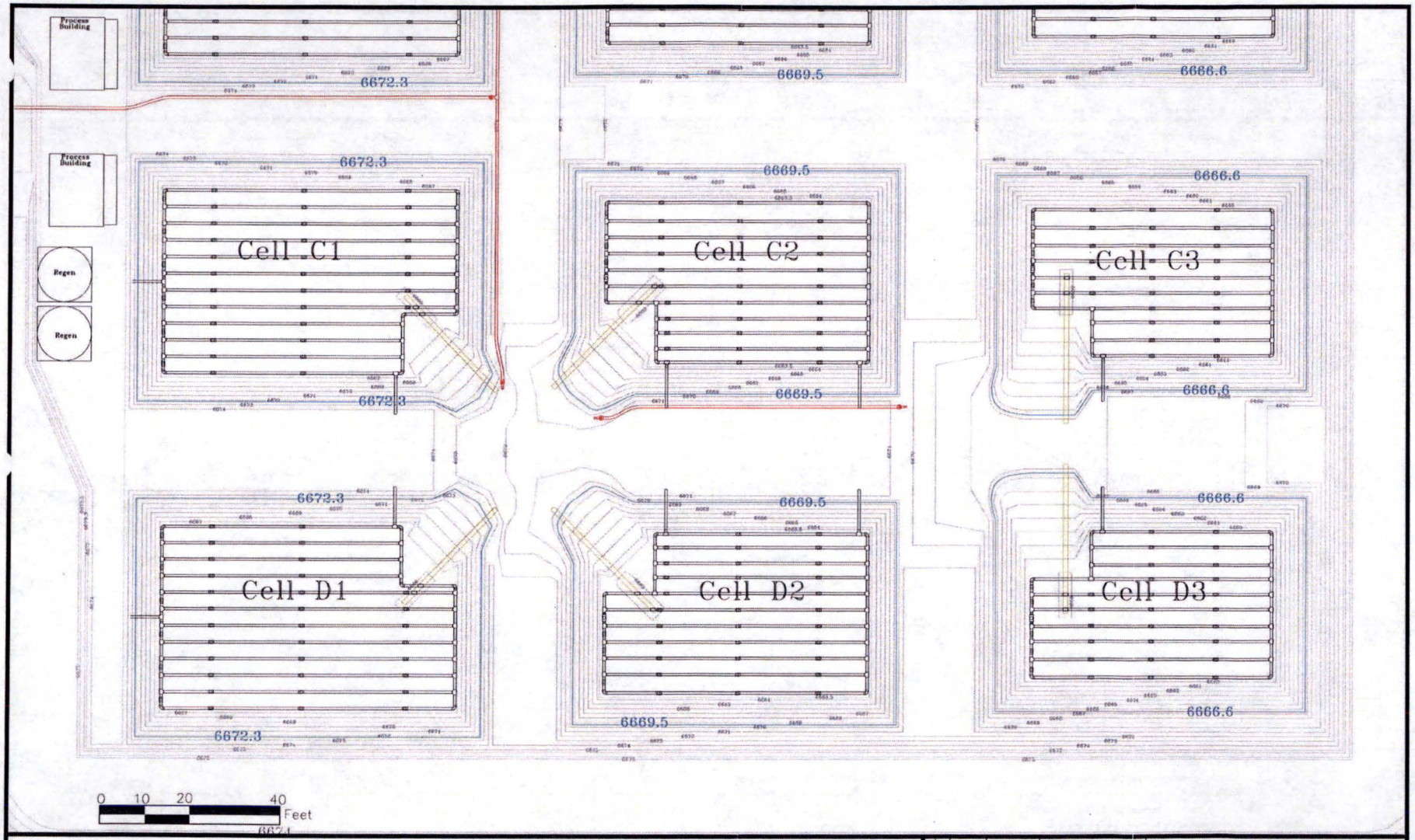
Homestake Mining Company
Grants New Mexico
1200 GPM Zeolite System

North Cell Distribution Piping
With Top of Liner Surface
And Regen Discharge System

Sheet 18



Legend

- Top of Liner or Surface Contour
- Water Distribution Plumbing
- Regen Pumping Plumbing
- Zeolite Level
- Regen Pump Access Pipe
- Regen — Regen Mixing Tank
- Process Building

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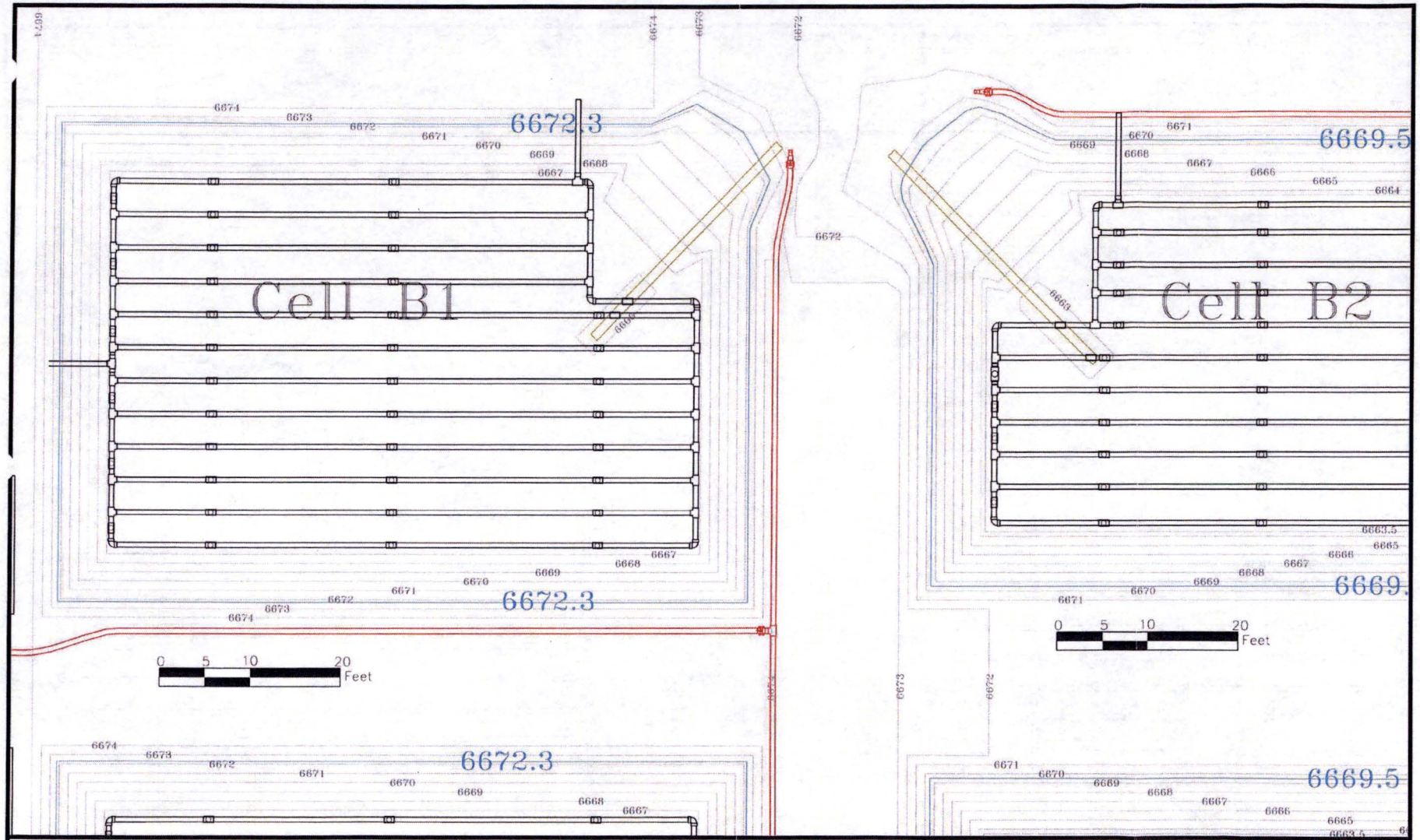
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

South Cell Distribution Piping With Top of Liner Surface And Regen Discharge System

Sheet 19



Legend

- Top of Liner or Surface Contour
- Water Distribution Plumbing
- Regen Pumping Plumbing
- Zeolite Level
- Regen Pump Access Pipe
- Regen — Regen Mixing Tank
- Process Building

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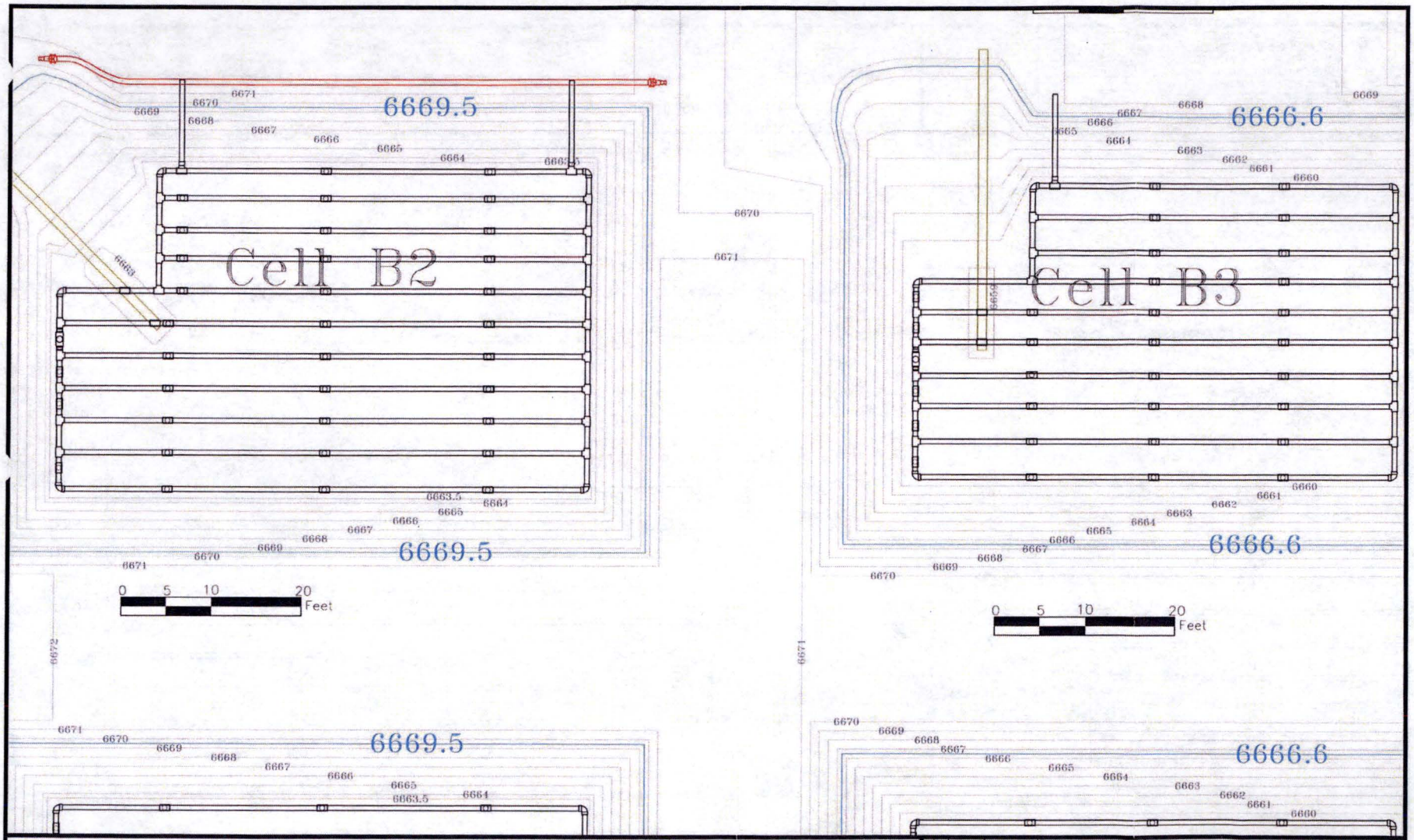
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System
Distribution Detail #1
Cell Distribution Piping
With Top of Liner Surface
And Regen Discharge System
Sheet 20



Legend

- Top of Liner or Surface Contour
- Water Distribution Plumbing
- Regen Pumping Plumbing
- Zeolite Level
- Regen Pump Access Pipe
- Regen — Regen Mixing Tank
- Process Building

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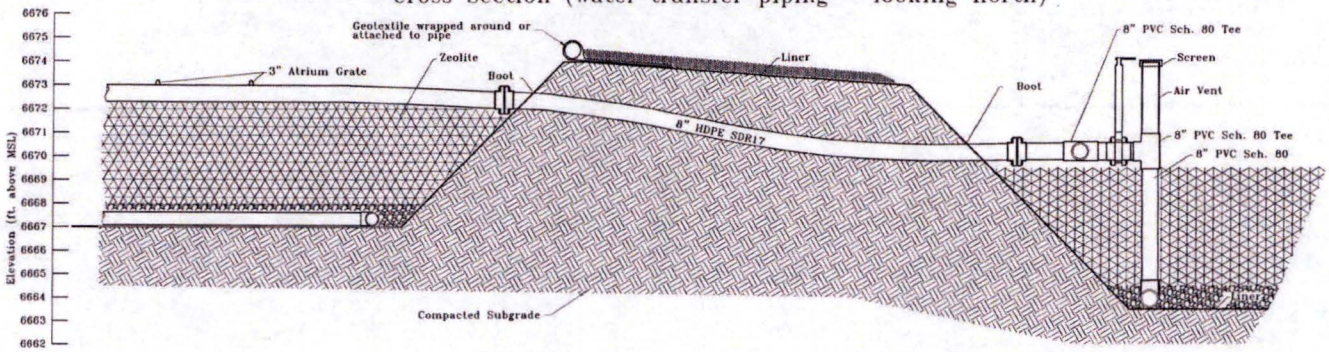
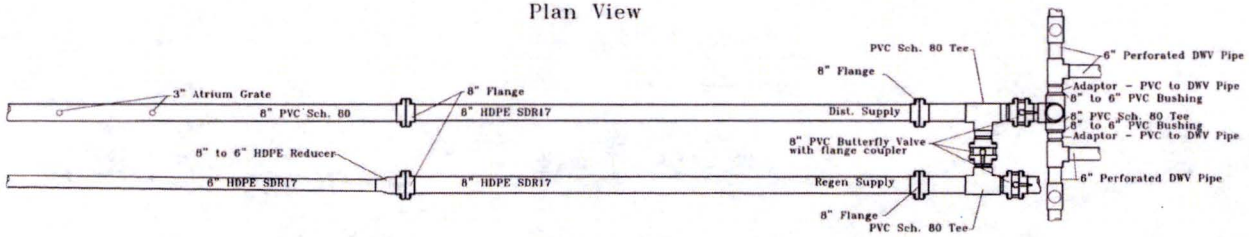
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System
Distribution Detail #2
Cell Distribution Piping
With Top of Liner Surface
And Regen Discharge System
Sheet 21

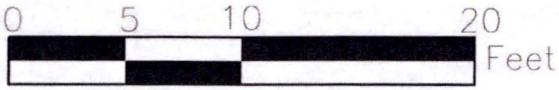
Train A - Cell #1 to Cell #2 Piping Manifold

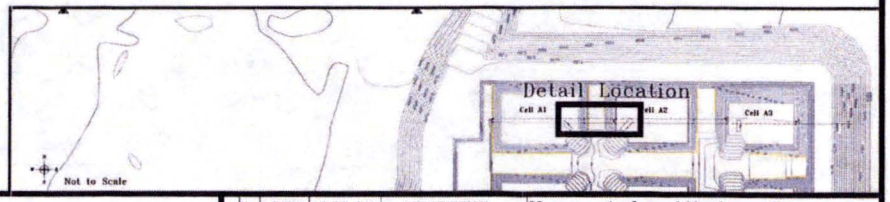
Cross Section (water transfer piping - looking north)



Plan View







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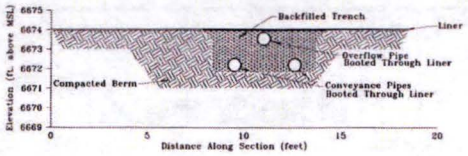
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Cell Water Transfer Piping

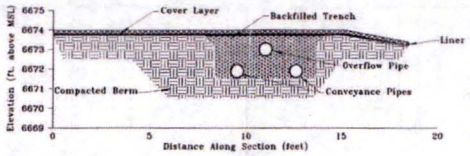
Sheet 22

Cell Water Transfer Configuration

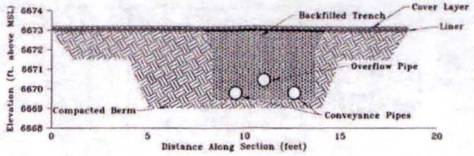
Cell #1 to Cell #2 Transfer Corridor
Section A (looking east)



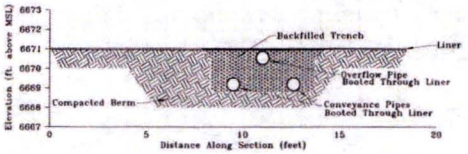
Cell #1 to Cell #2 Transfer Corridor
Section B (looking east)



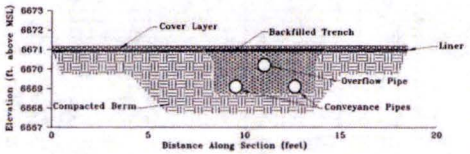
Cell #1 to Cell #2 Transfer Corridor
Section C (looking east)



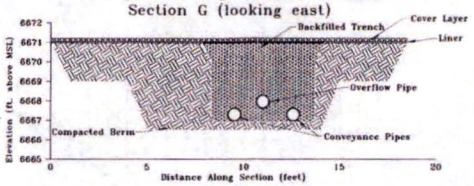
Cell #2 to Cell #3 Transfer Corridor
Section E (looking east)



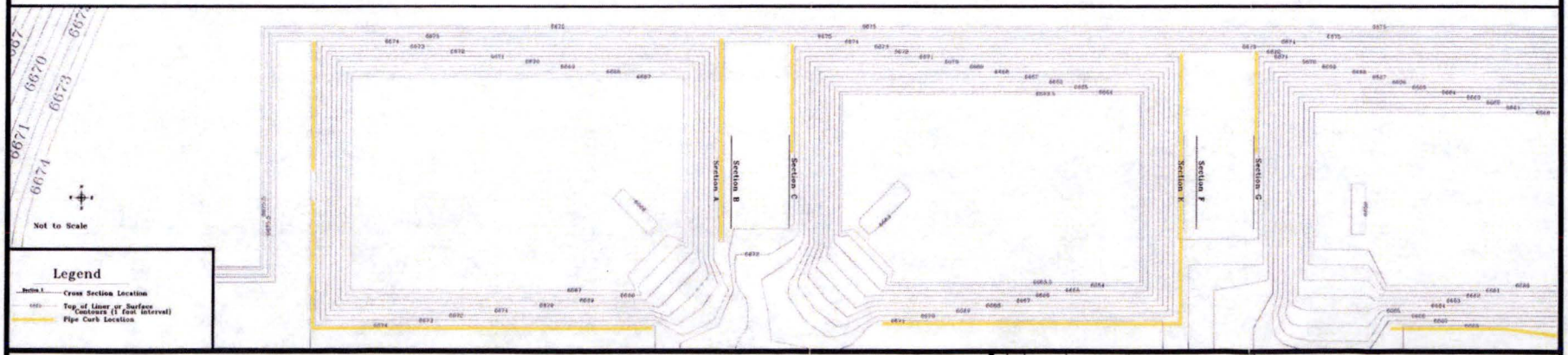
Cell #2 to Cell #3 Transfer Corridor
Section F (looking east)



Cell #2 to Cell #3 Transfer Corridor
Section G (looking east)



0 1.5 3 6 Feet



Legend

- Cross Section Location
- Top of Liner or Surface Contours (1 foot interval)
- Pipe Curb Location

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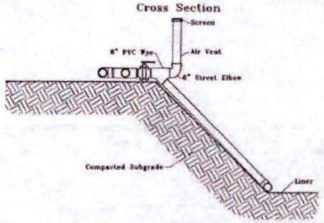
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Cell Water Transfer Trench and Piping

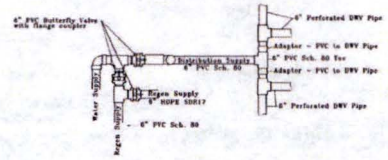
Sheet 23

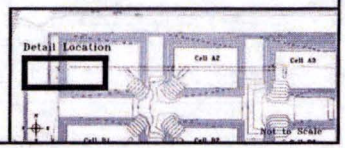
Train A - Cell #1 Input Manifold

Cross Section



Plan View

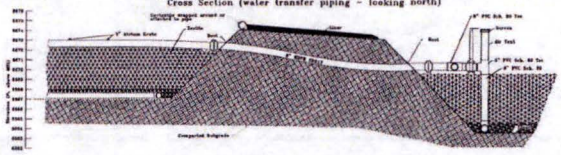




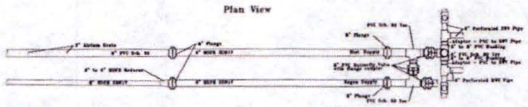
Not to Scale

Train A - Cell #1 to Cell #2 Piping Manifold

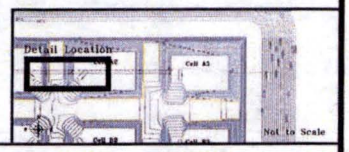
Cross Section (water transfer piping - looking north)



Plan View



0 5 10 20 Feet

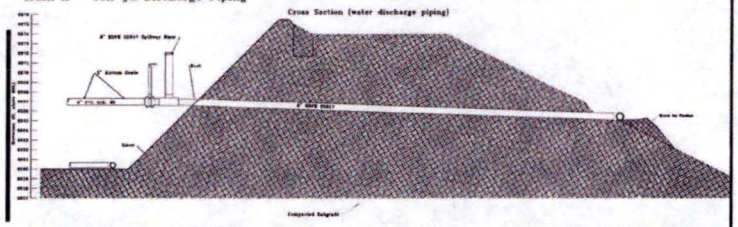


Not to Scale

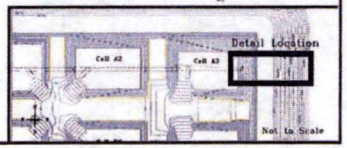
Train A - Cell #3 Discharge Piping

Cross Section (looking east)

Cross Section (water discharge piping)



Plan View



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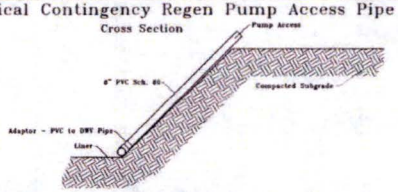
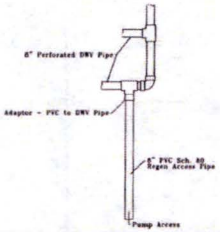
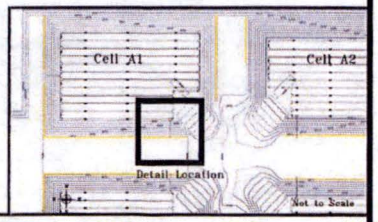
Typical Contingency Regen Pump Access Pipe

Cross Section



Plan View





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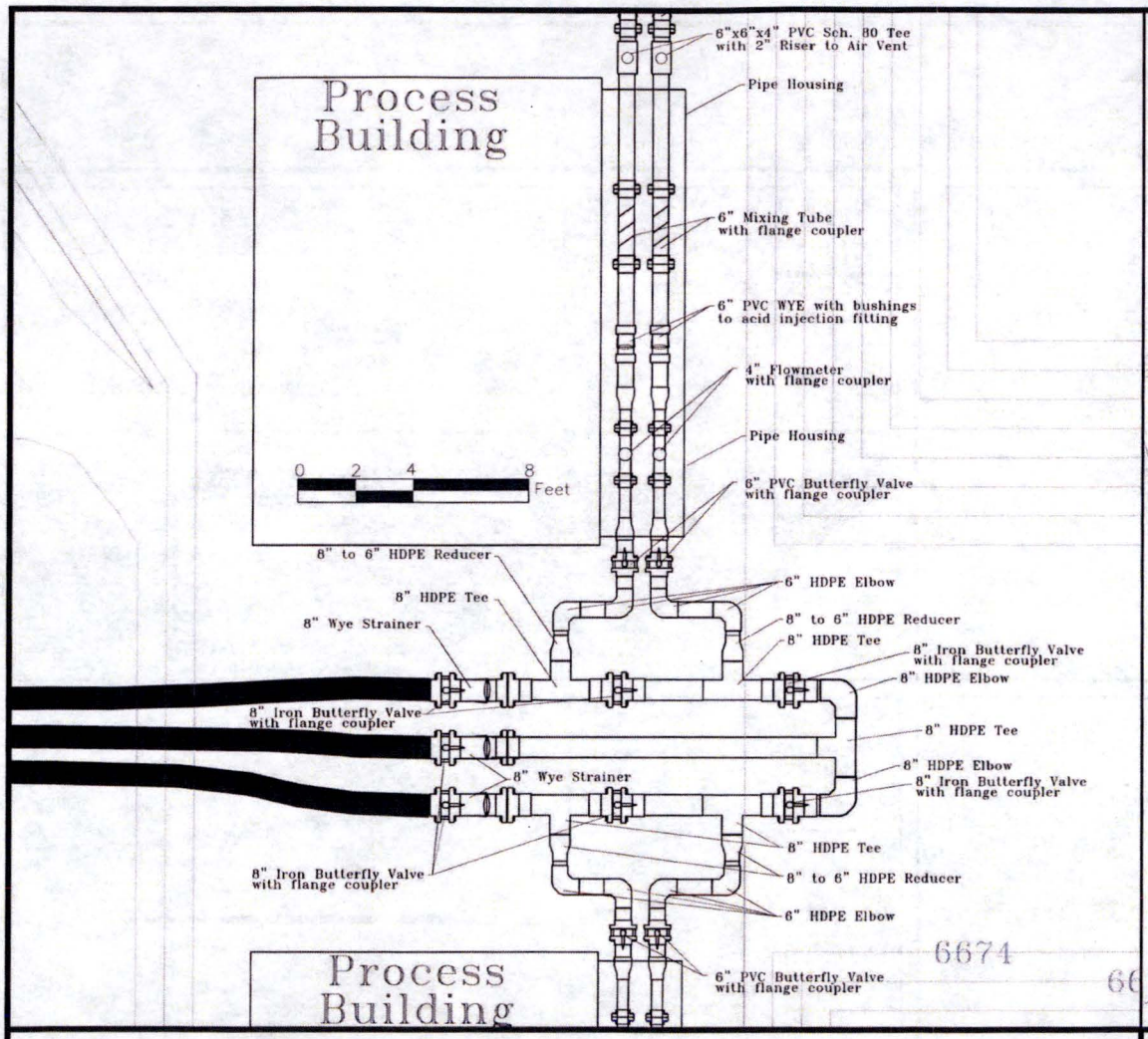
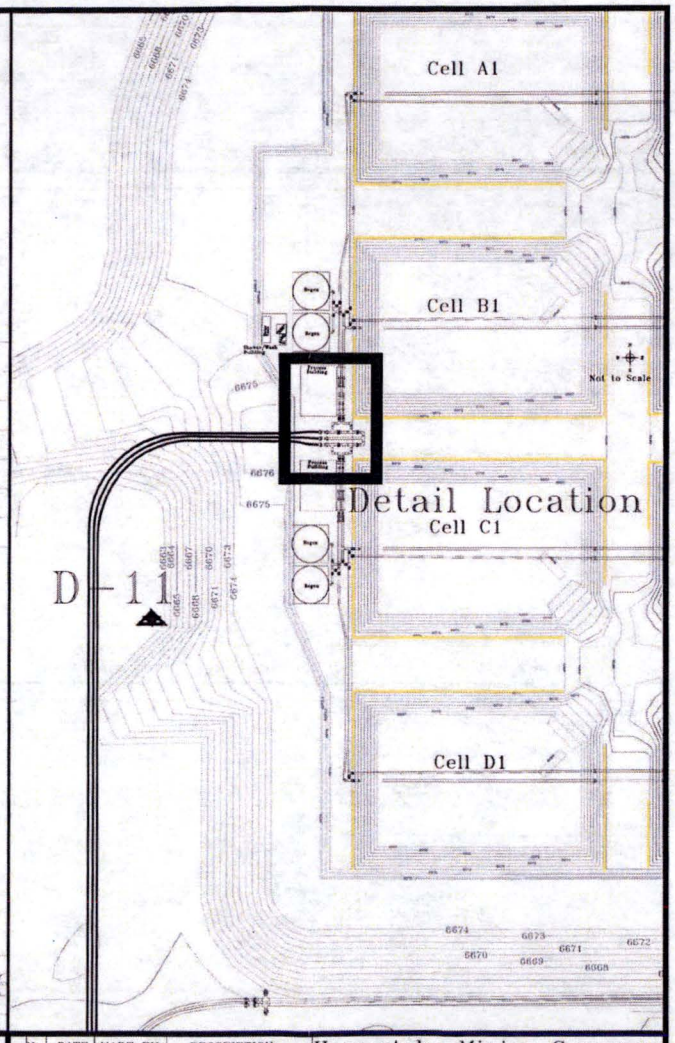
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Cell Water Supply, Treated Water Discharge and Regen Pumping Cross Section Details

Sheet 24





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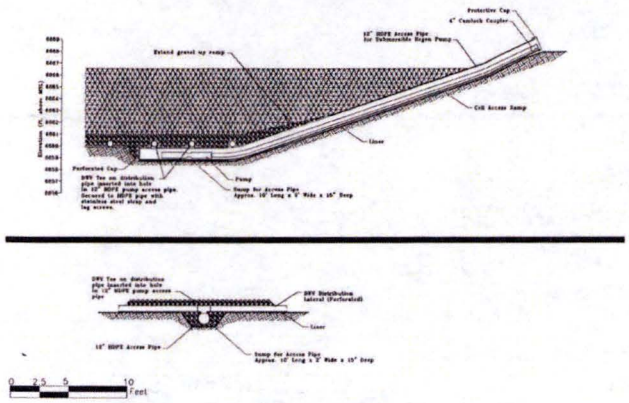
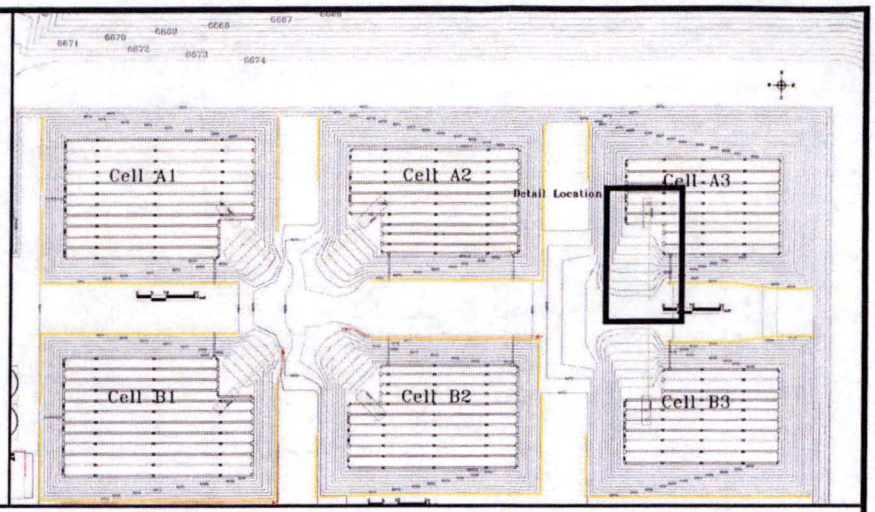
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Zeolite System Supply Manifold

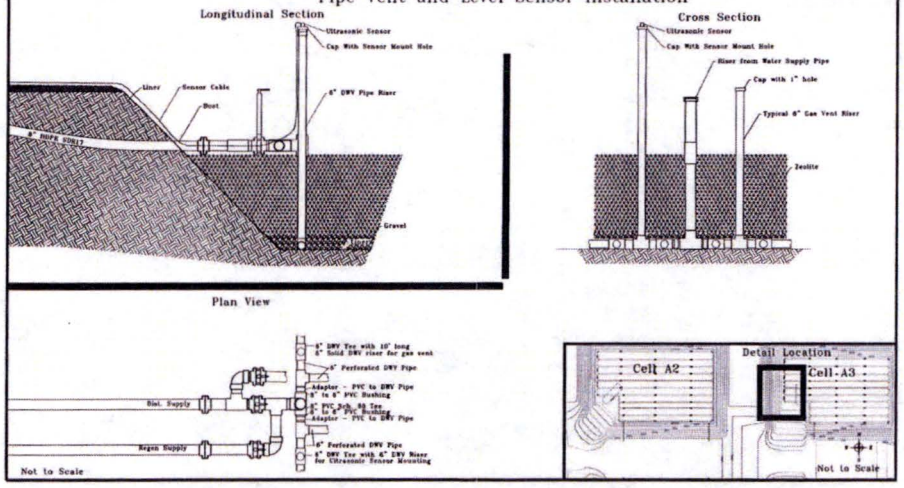
Sheet 25

Typical Regen Pump and Access Pipe Configuration
(Cell A3 Shown - Looking East)





Pipe Vent and Level Sensor Installation



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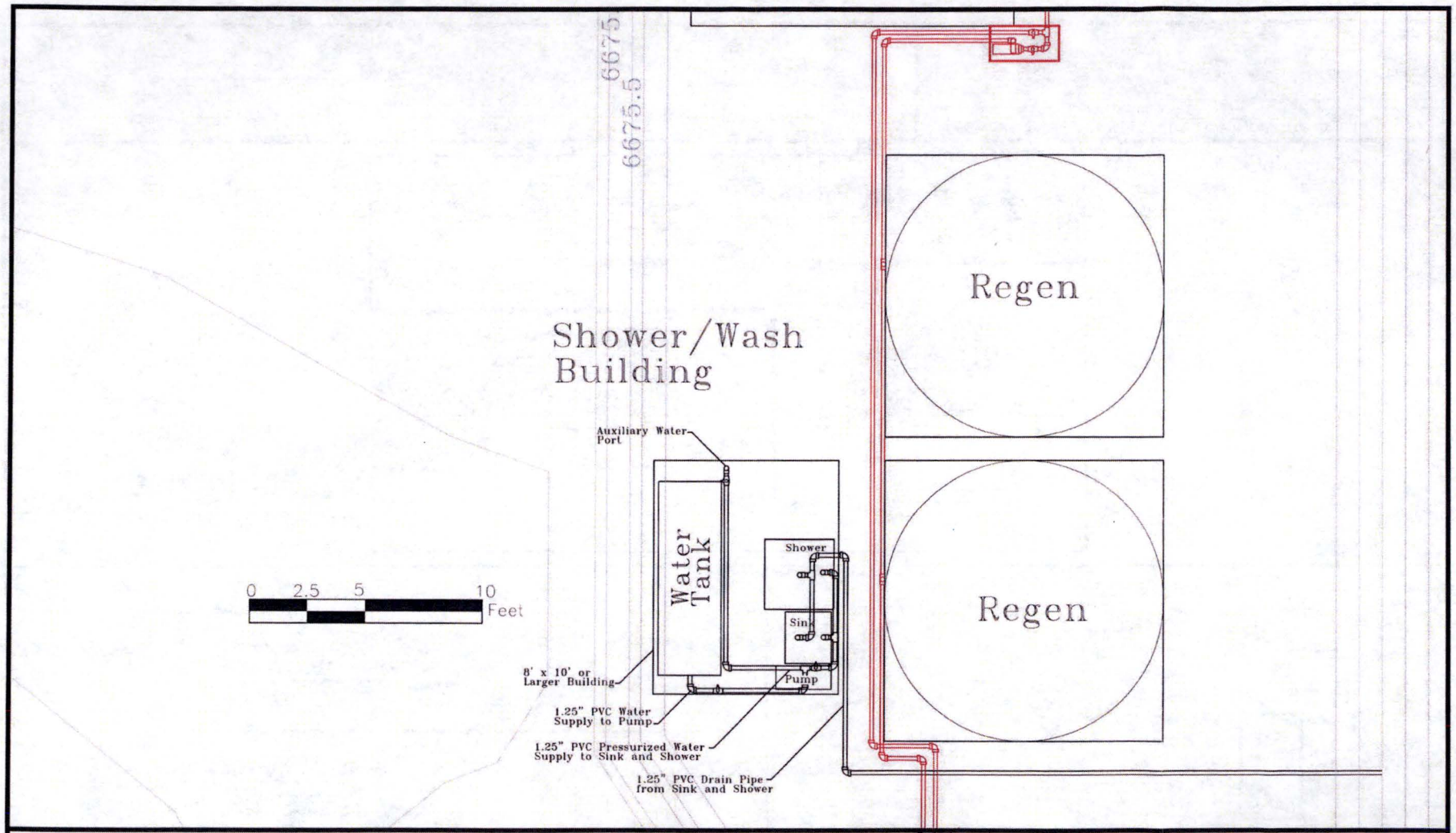
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Regen Pumping System and Water Distribution System Details

Sheet 26



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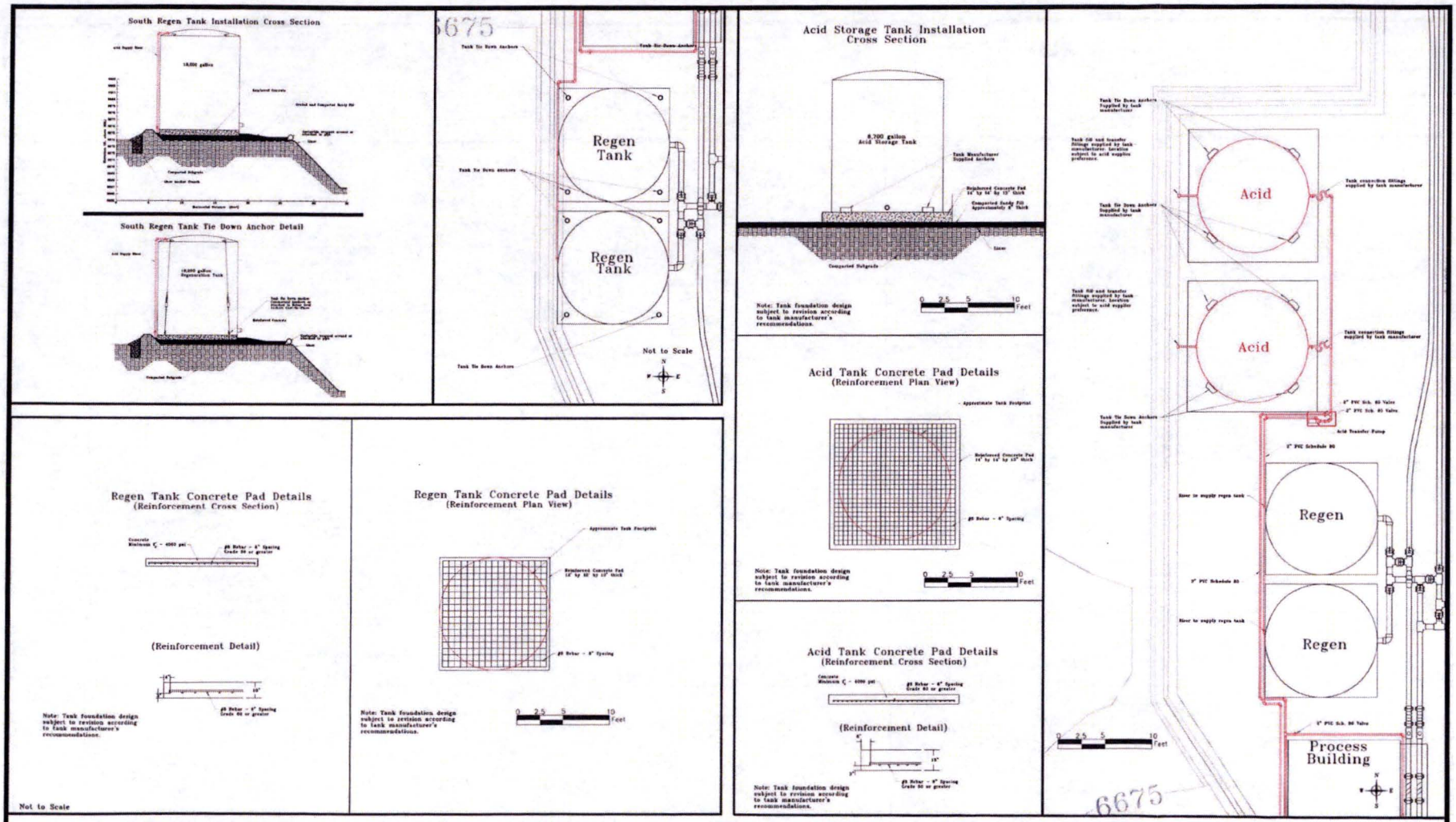
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Shower Building Details

Sheet 27



Note: Regen tank arrangement shown for Trains D & C.
The locations and installation for Trains A & B
will be very similar to a mirror image of those shown above.

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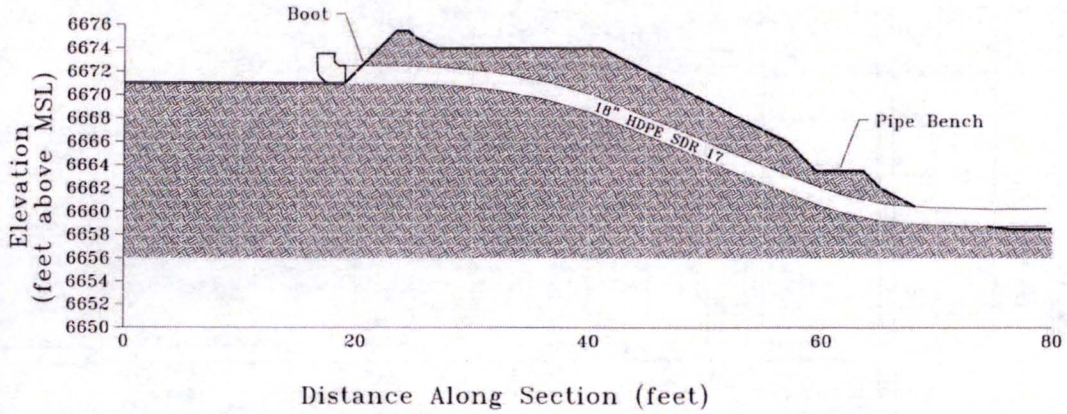
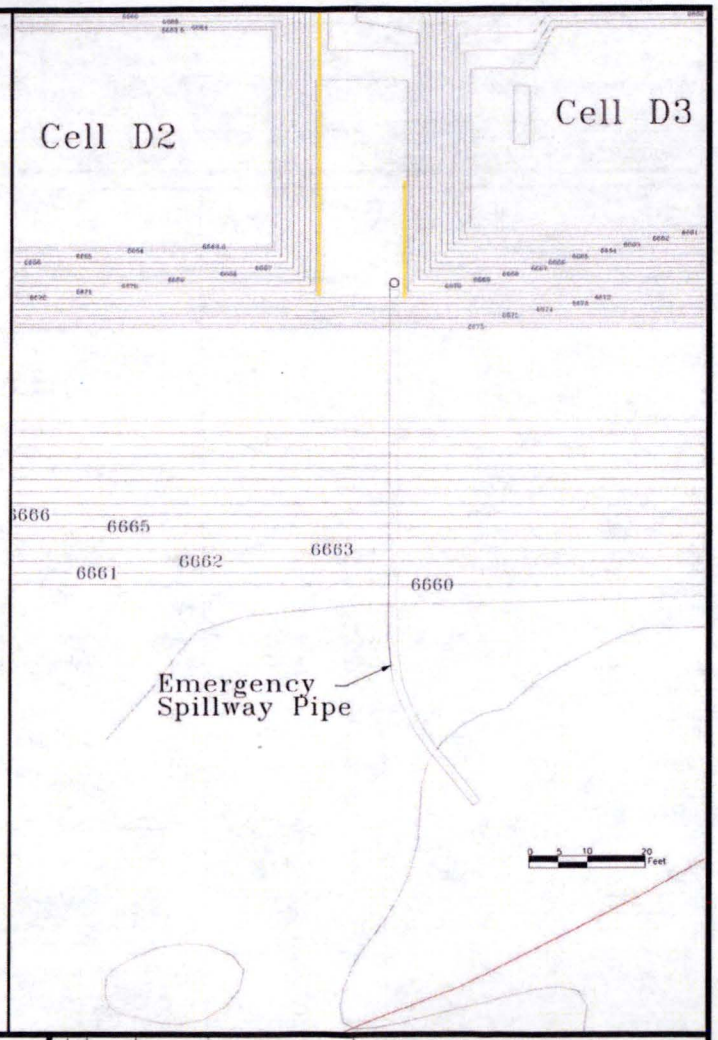
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Tank Installation and Anchorage Detail

Sheet 28

Emergency Spillway Cross Section
(Looking East)





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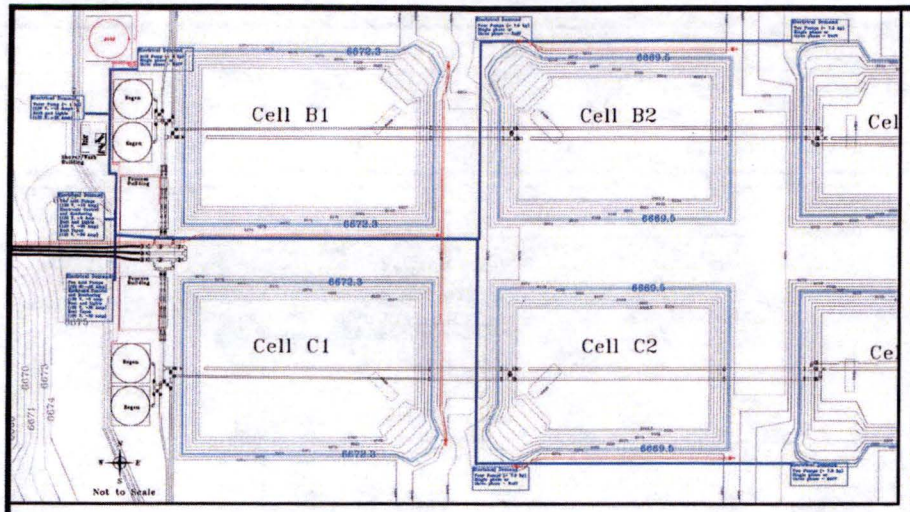
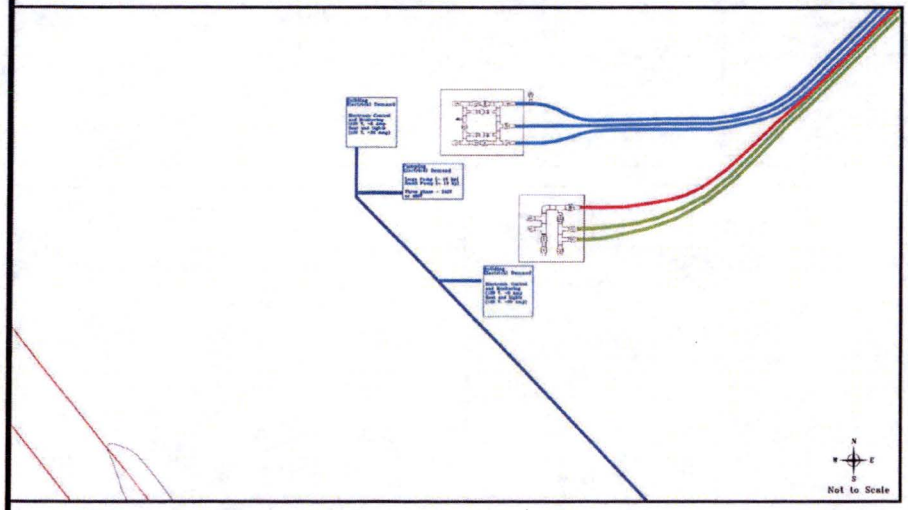
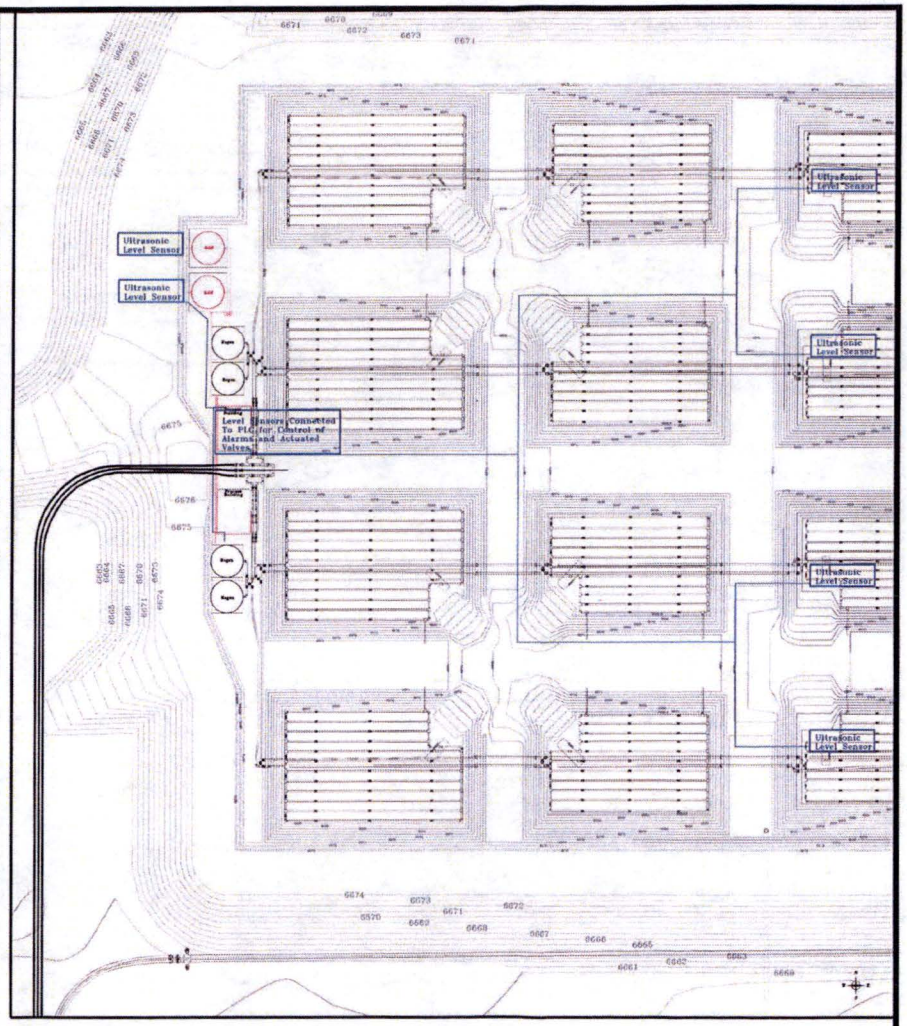
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Zeolite System Emergency Spillway

Sheet 29







Legend

General Electrical Power Distribution

Description of Electrical Demand

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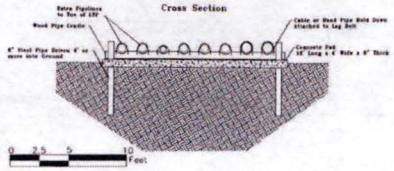
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Electrical Supply System and
Electronic Control System Schematic

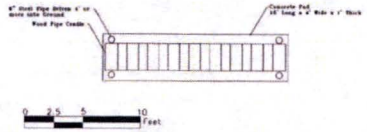
Sheet 30

Pipe Anchor Block at LTP Crest

Cross Section



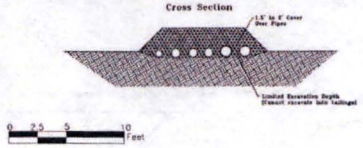
Plan View



Not to Scale

Typical One-Level Pipe Corridor Earth Coverage Where Allowable Excavation is Limited

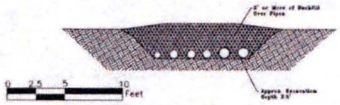
Cross Section



Typical One-Level Pipe Corridor Road Crossing

(Assumes Allowable Excavation is Not Limited)

Cross Section



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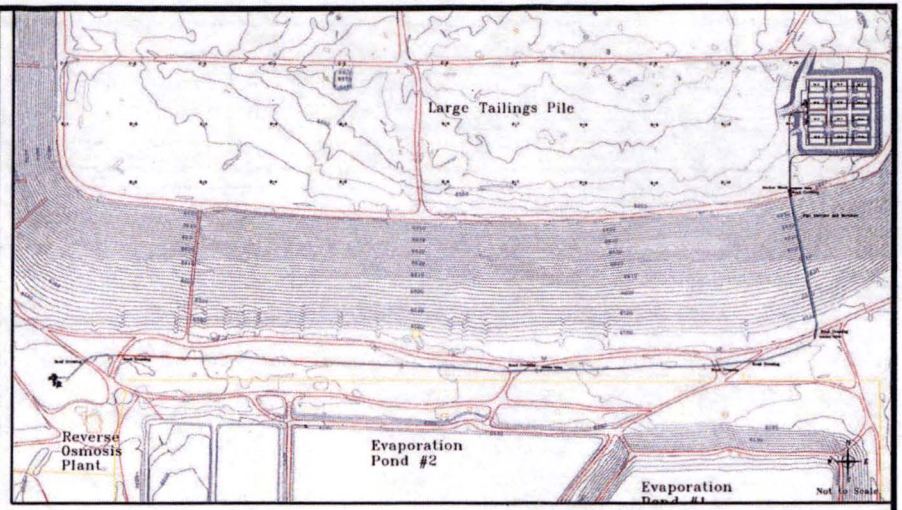
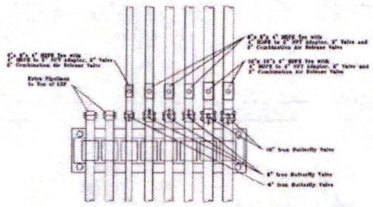
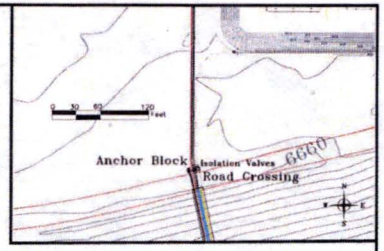
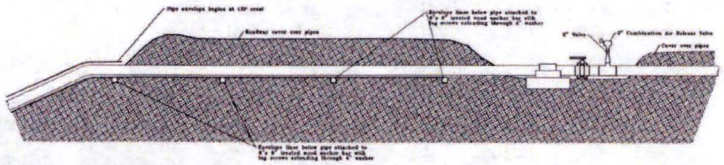


Pipe Anchor Block and Air Release Valves



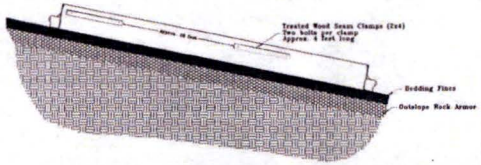




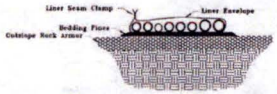
Not to Scale

Outslope Pipe Corridor Containment

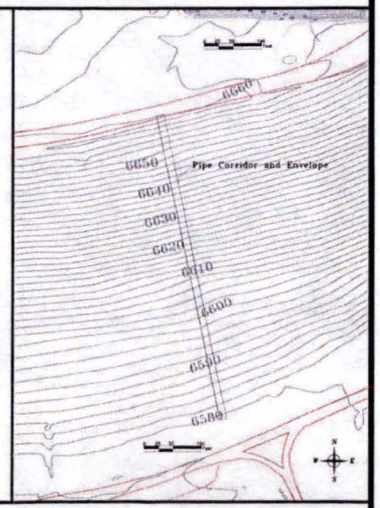
Cross Section (looking cross slope)



Cross Section (looking upslope)



Not to Scale



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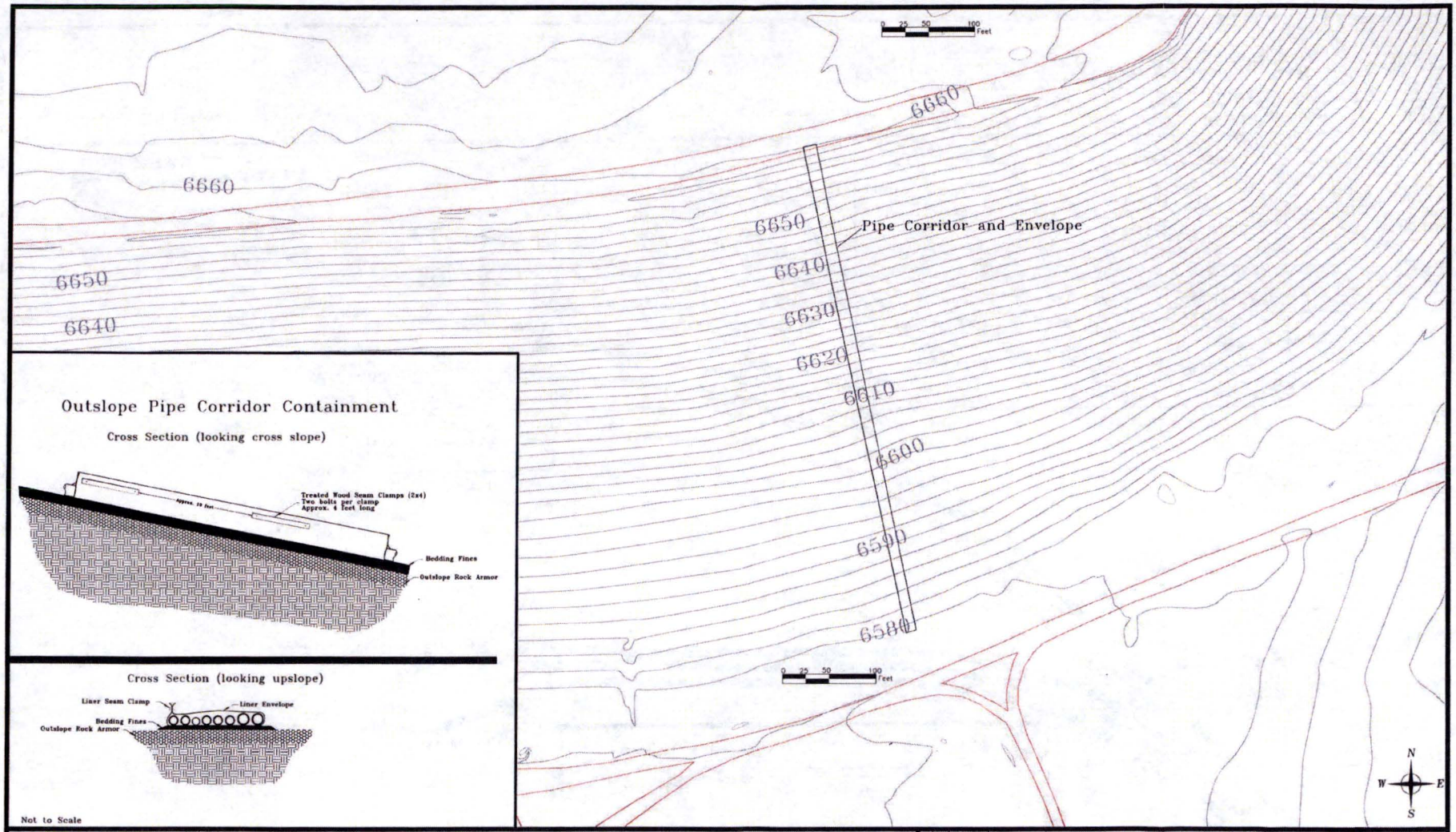
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Pipe Outslope Envelope, Anchor Block and Pipe Corridor Details

Sheet 31



Outslope Pipe Corridor Containment

Cross Section (looking cross slope)

Cross Section (looking upslope)

Not to Scale

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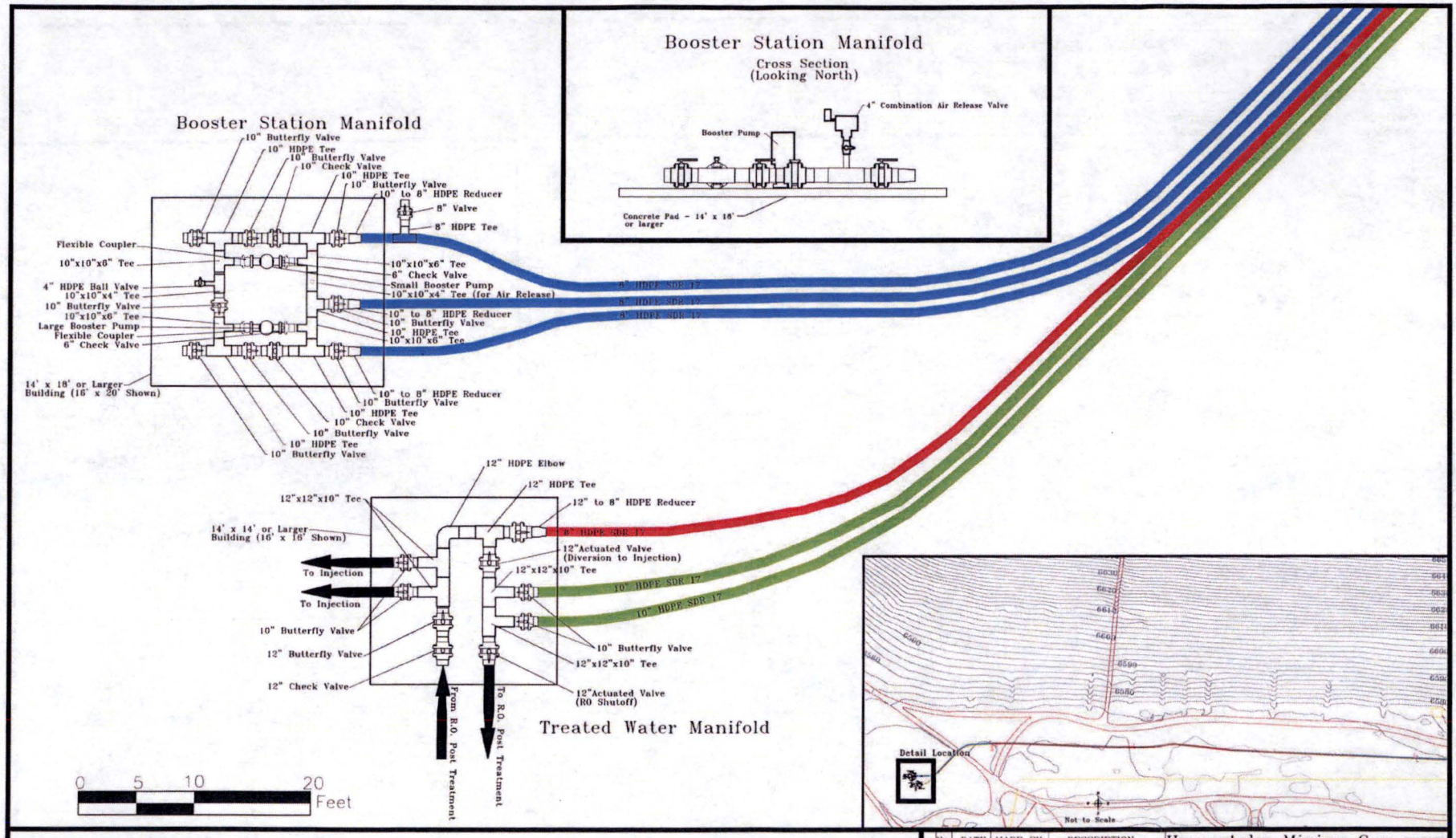
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Pipe Outslope Envelope

Sheet 32



Legend

- Zeolite Water Supply Pipe
- Zeolite Discharge Pipe
- Future Injection Pipe

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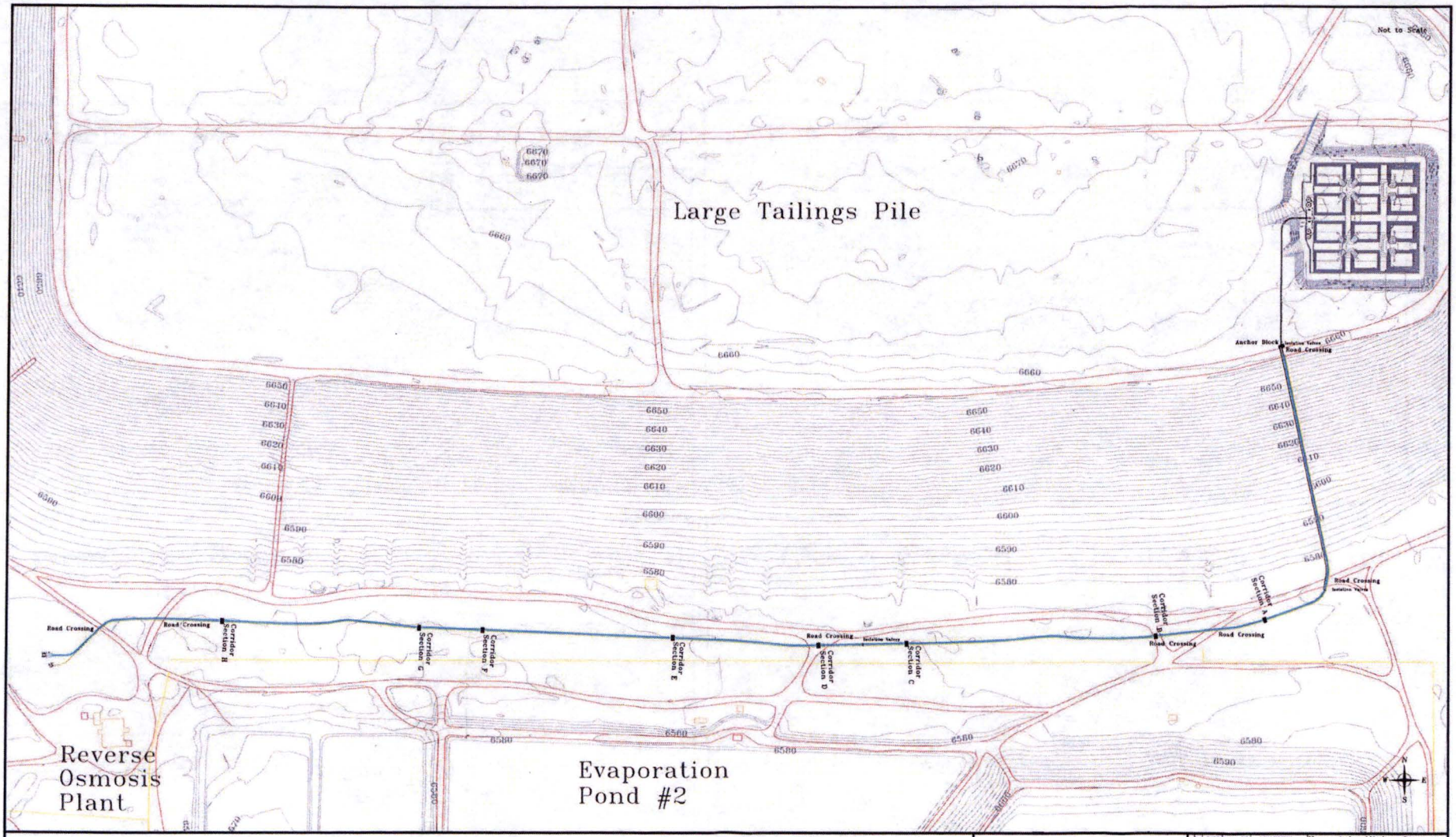
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Booster Station Manifold and
Treated Water Manifold

Sheet 33



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Legend

- Water Supply Pipe
- Cell Discharge Pipe
- Regen System Pipe

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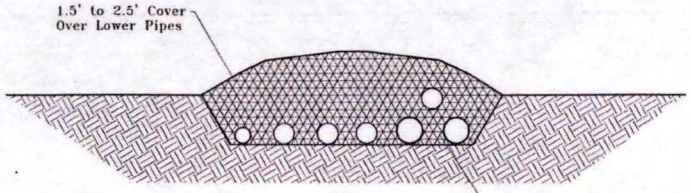
Homestake Mining Company
Gold Bar Mining
1200 GPM Facility System

Treatment Supply and Injection Supply Pipe Alignment

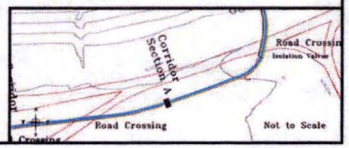
Sheet 34

Pipe Corridor Section A

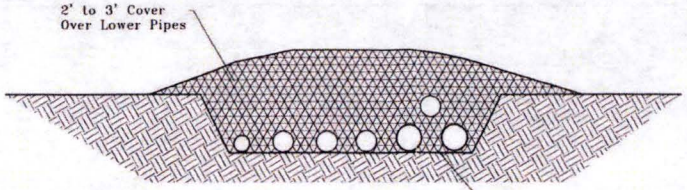


Note: Lower pipes are 3 - 8" Zeolite Supply
2 - 10" Zeolite Discharge, and
1 - 6" Regen Discharge
Upper pipe is 1 - 8" Future Collection line

0 2.5 5 10 Feet

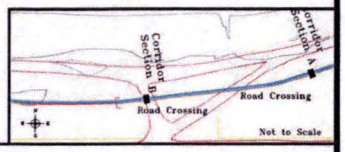


Pipe Corridor Section B

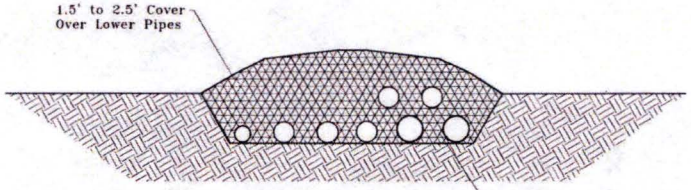


Note: Lower pipes are 3 - 8" Zeolite Supply
2 - 10" Zeolite Discharge, and
1 - 6" Regen Discharge
Upper pipe is 1 - 8" Future Collection line

0 2.5 5 10 Feet

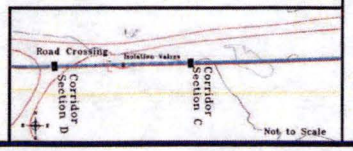


Pipe Corridor Section C

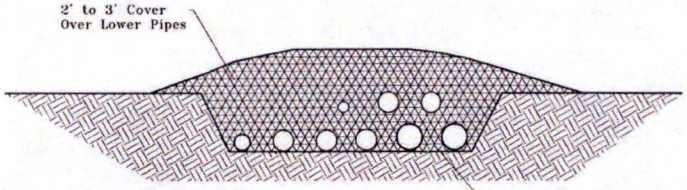


Note: Lower pipes are 3 - 8" Zeolite Supply
2 - 10" Zeolite Discharge, and
1 - 6" Regen Discharge
Upper pipes are 1 - 8" Future Collection line
and 1 - 8" Future Injection line

0 2.5 5 10 Feet

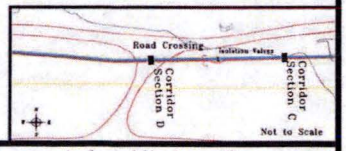


Pipe Corridor Section D



Note: Lower pipes are 3 - 8" Zeolite Supply
2 - 10" Zeolite Discharge, and
1 - 6" Regen Discharge
Upper pipes are 1 - 8" Future Collection line,
1 - 8" Future Injection line, and
1 - 4" LTP Collection line

0 2.5 5 10 Feet



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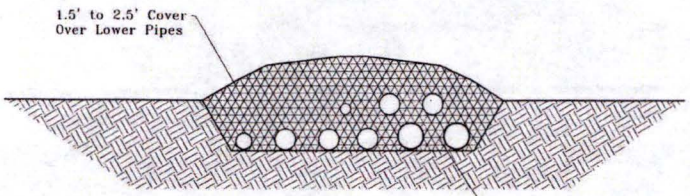
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Pipe Corridor Section Diagrams
Section A through D

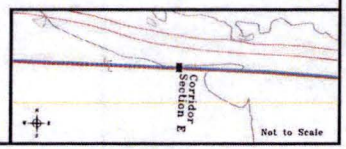
Sheet 35

Pipe Corridor Section E

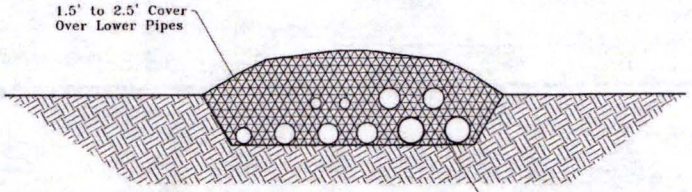


Note: Lower pipes are 3 - 8" Zeolite Supply
2 - 10" Zeolite Discharge, and
1 - 6" Regen Discharge
Upper pipes are 1 - 8" Future Collection line,
1 - 8" Future Injection line, and
1 - 4" LTP Collection line

0 2.5 5 10 Feet

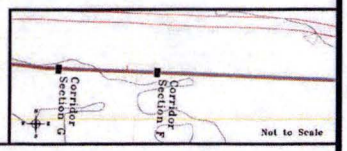


Pipe Corridor Section F

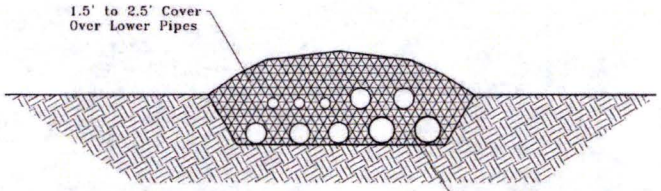


Note: Lower pipes are 3 - 8" Zeolite Supply
2 - 10" Zeolite Discharge, and
1 - 6" Regen Discharge
Upper pipes are 1 - 8" Future Collection line,
1 - 8" Future Injection line, and
2 - 4" LTP Collection lines

0 2.5 5 10 Feet

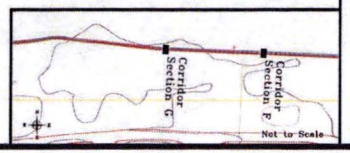


Pipe Corridor Section G

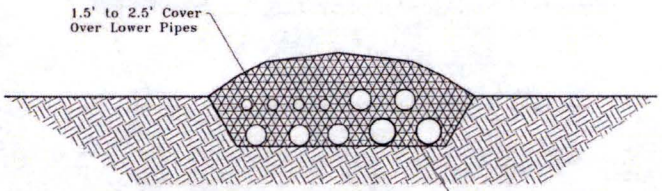


Note: Lower pipes are 3 - 8" Zeolite Supply
and 2 - 10" Zeolite Discharge
Upper pipes are 1 - 8" Future Collection line,
1 - 8" Future Injection line, and
3 - 4" LTP Collection lines

0 2.5 5 10 Feet

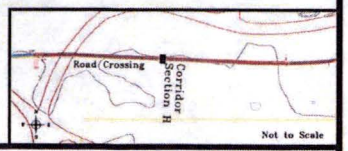


Pipe Corridor Section H



Note: Lower pipes are 3 - 8" Zeolite Supply
and 2 - 10" Zeolite Discharge
Upper pipes are 1 - 8" Future Collection line,
1 - 8" Future Injection line, and
4 - 4" LTP Collection lines

0 2.5 5 10 Feet



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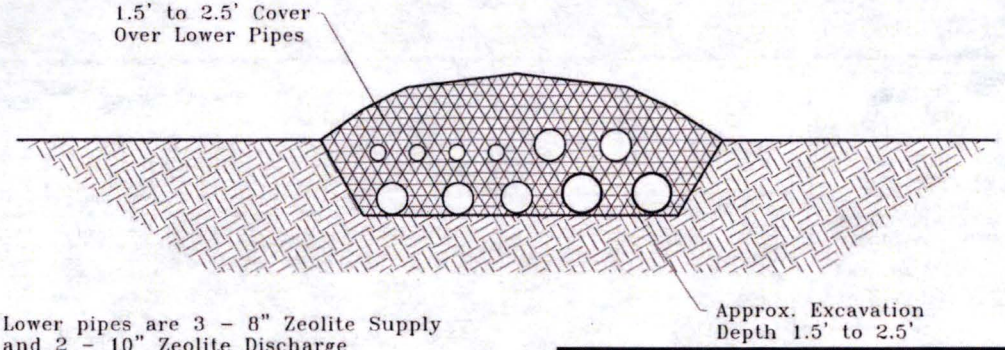
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

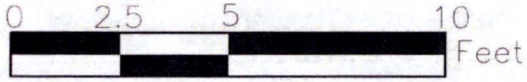
Pipe Corridor Section Diagrams
Sections E through H

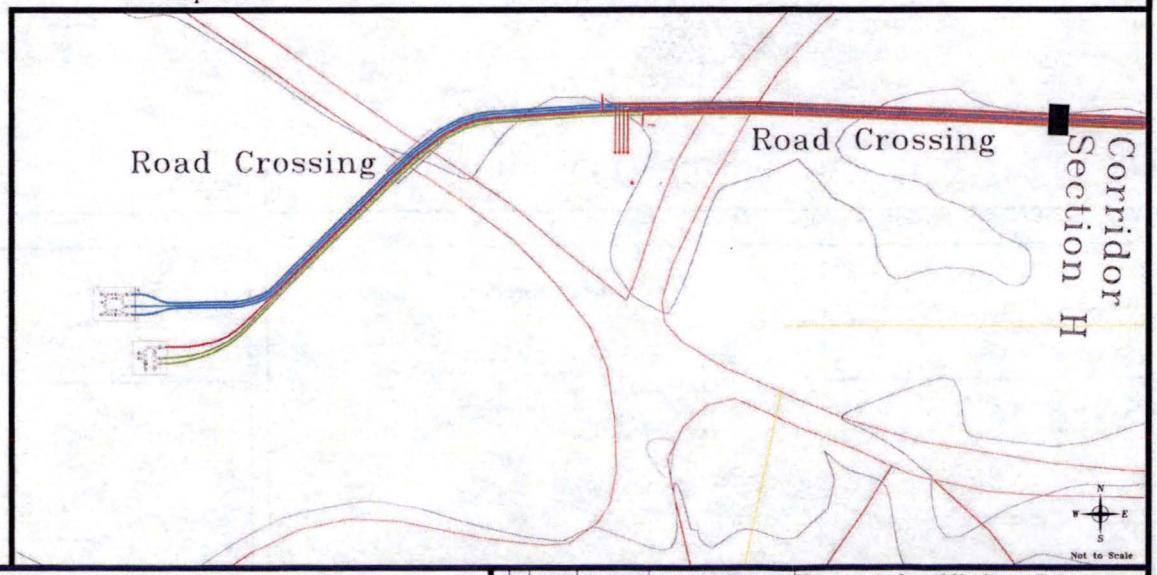
Sheet 36

Pipe Corridor Section H



Note: Lower pipes are 3 - 8" Zeolite Supply
and 2 - 10" Zeolite Discharge
Upper pipes are 1 - 8" Future Collection line,
1 - 8" Future Injection line, and
4 - 4" LTP Collection lines





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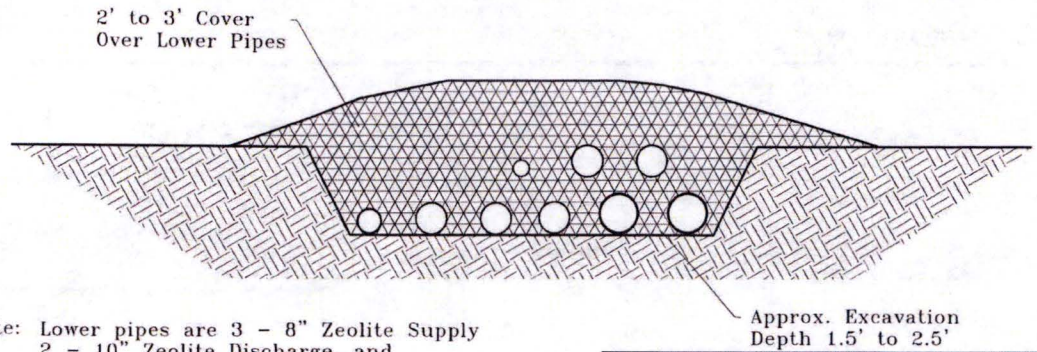
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Pipe Corridor Section Diagram
Section H

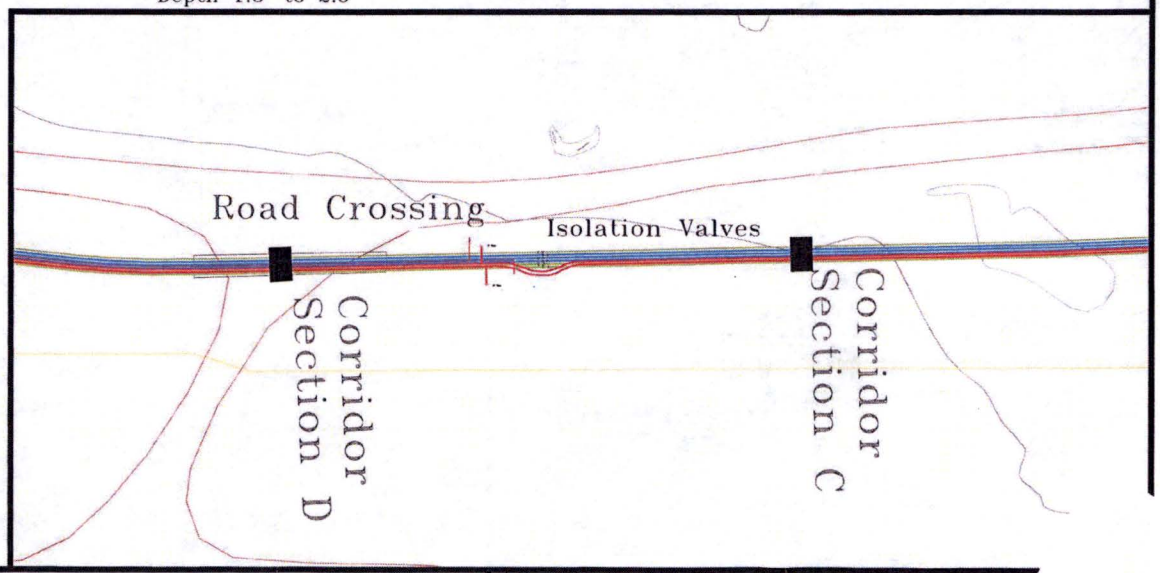
Sheet 37

Pipe Corridor Section D



Note: Lower pipes are 3 - 8" Zeolite Supply
2 - 10" Zeolite Discharge, and
1 - 6" Regen Discharge
Upper pipes are 1 - 8" Future Collection line,
1 - 8" Future Injection line, and
1 - 4" LTP Collection line

0 2.5 5 10 Feet



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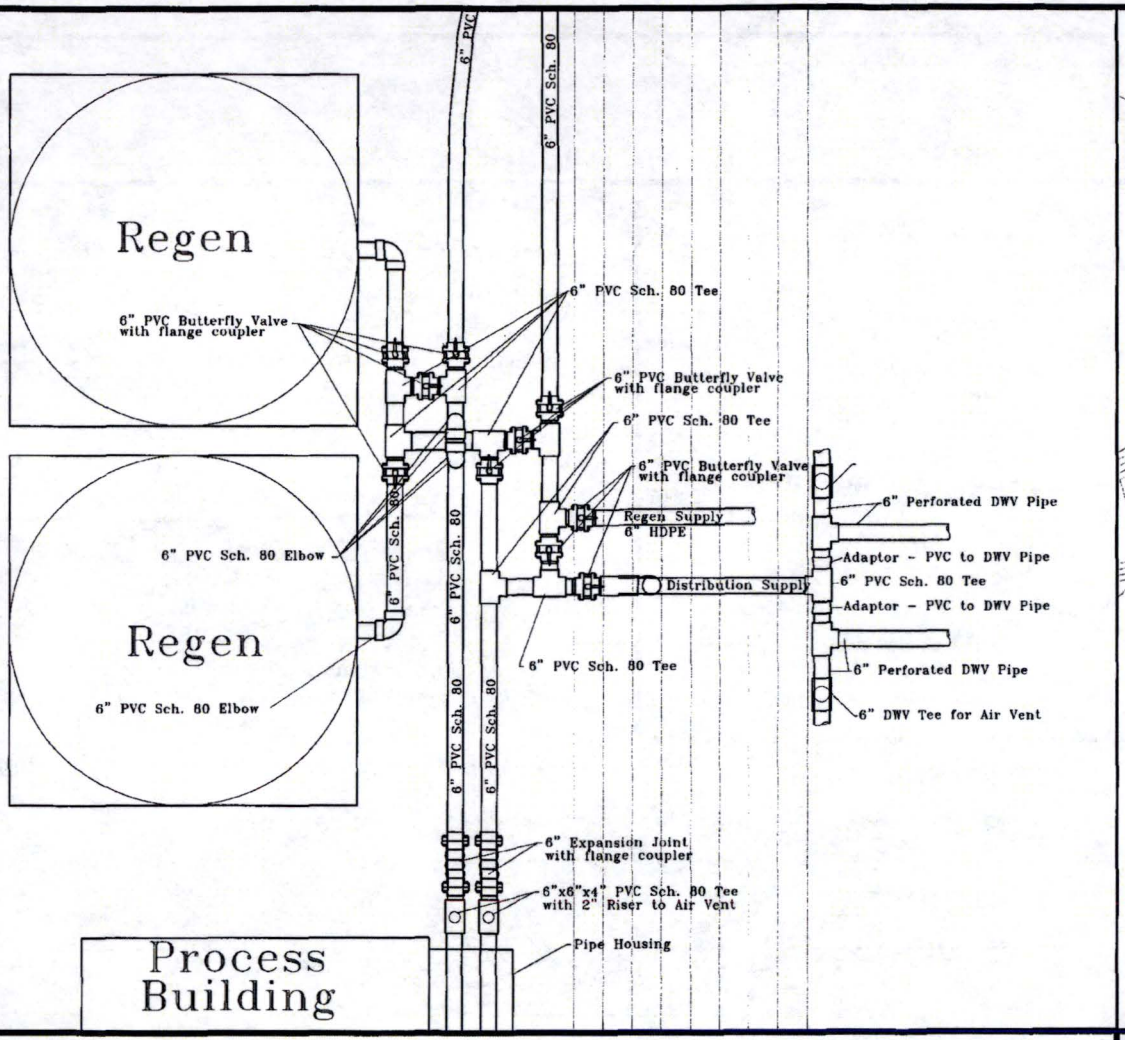
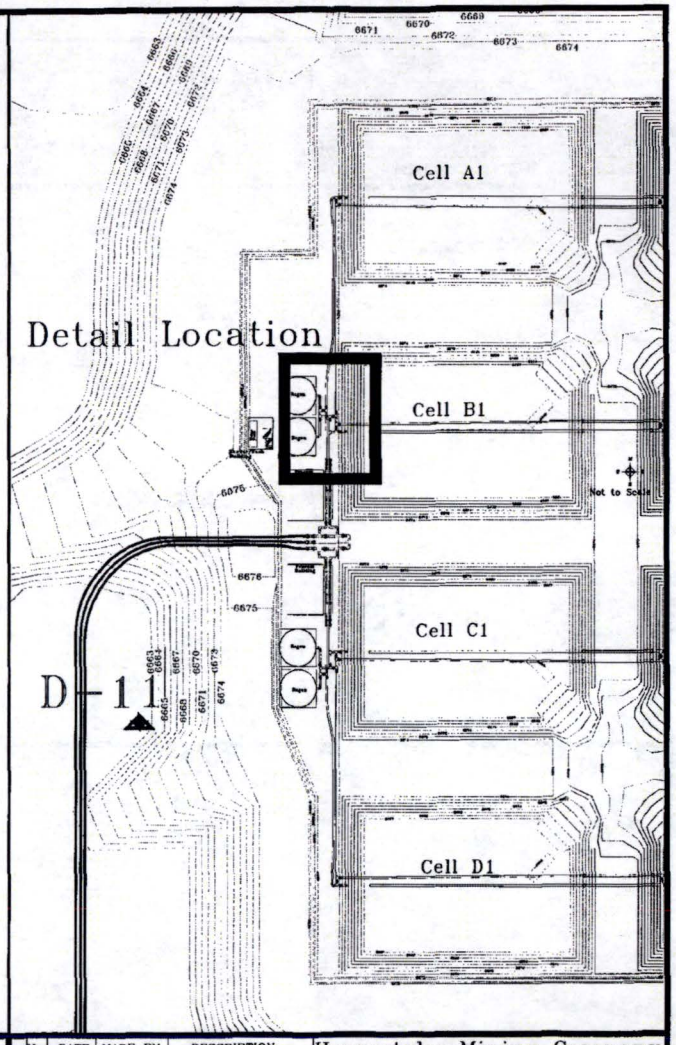
Homestake Mining
Grants, New Mexico
1200 GPM Zeolite

Pipe Corridor Sect
Sectior

Sheet 38





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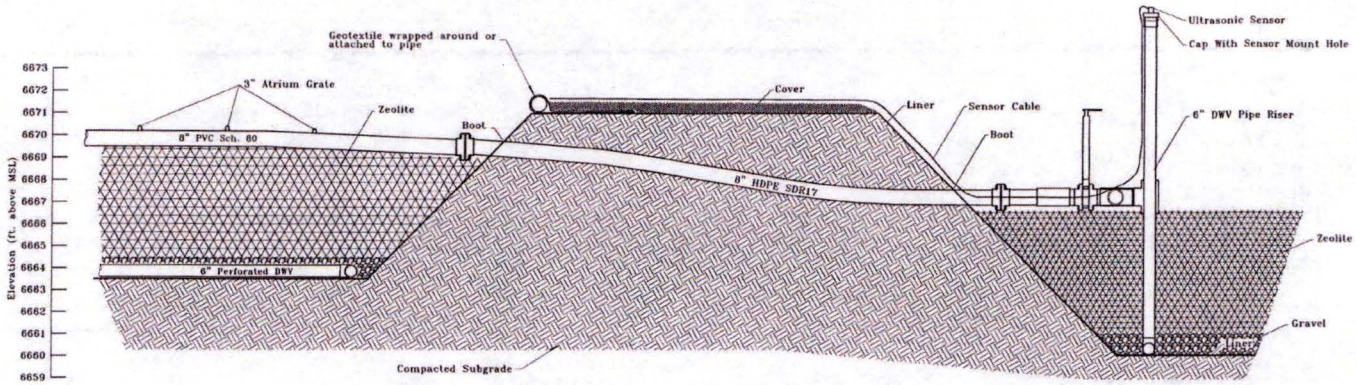
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Cell Supply Manifold Details

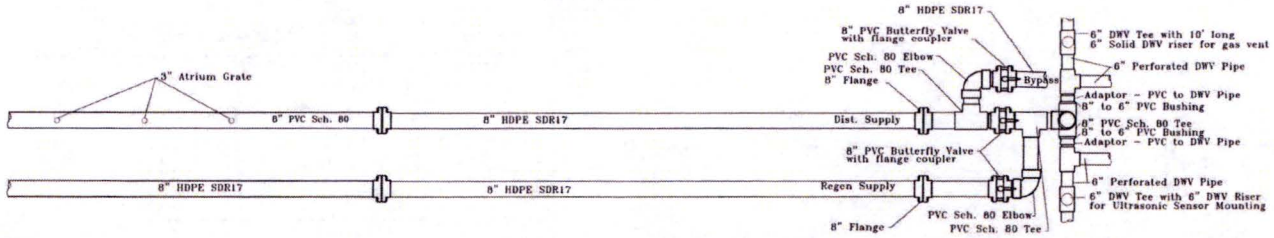
Sheet 39

Train A - Cell #2 to Cell #3 Piping Manifold

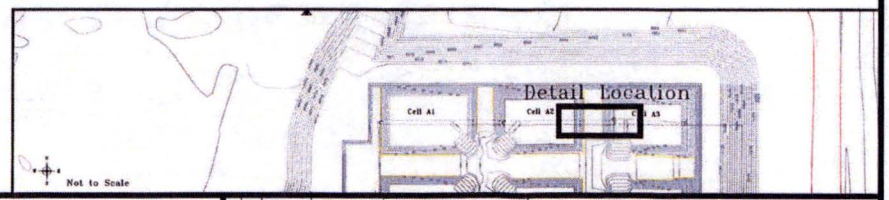
Cross Section (water transfer piping - looking north)



Plan View



0 5 10 20 Feet



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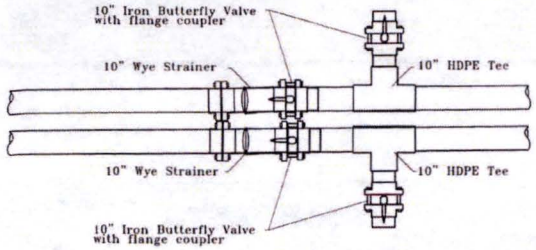
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Cell Supply Manifold Details

Sheet 40

Treated Water Wye Strainer

Plan View



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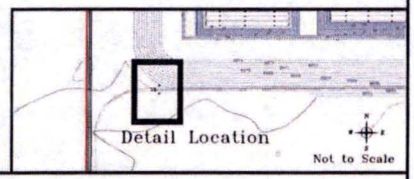
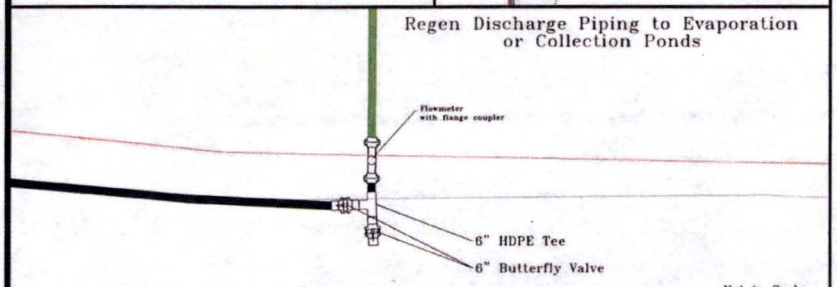


Not to Scale

Regen Discharge Piping to Evaporation or Collection Ponds



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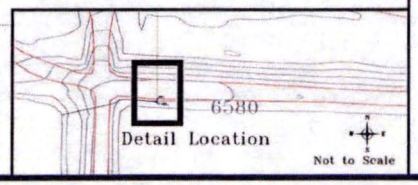
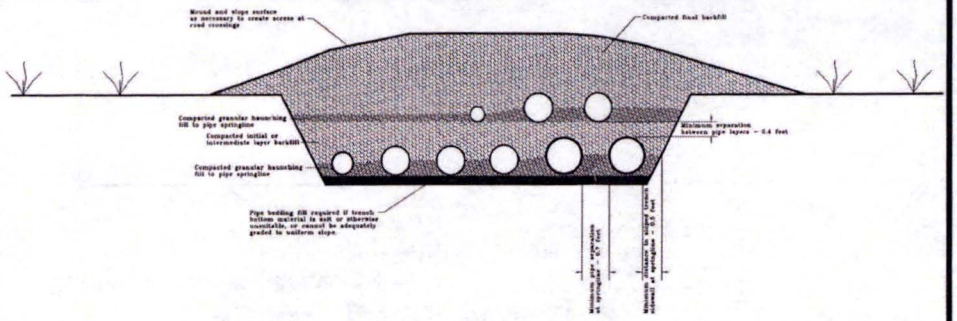


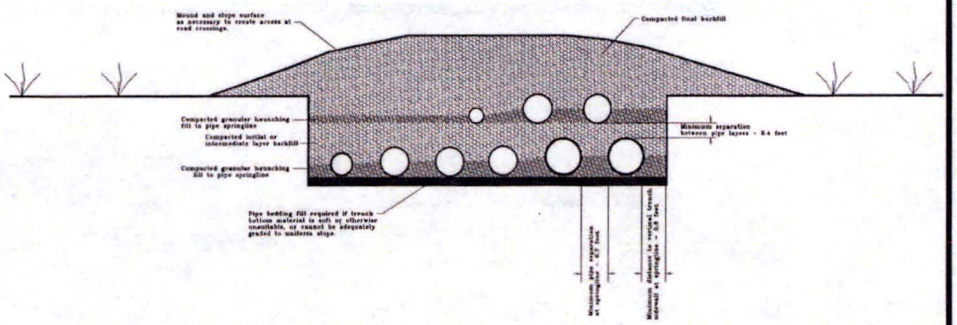
Not to Scale

Pipe Trench Detail

Sloped Sidewall Trench



Vertical Sidewall Trench



Not to Scale

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3-2015	TGM		

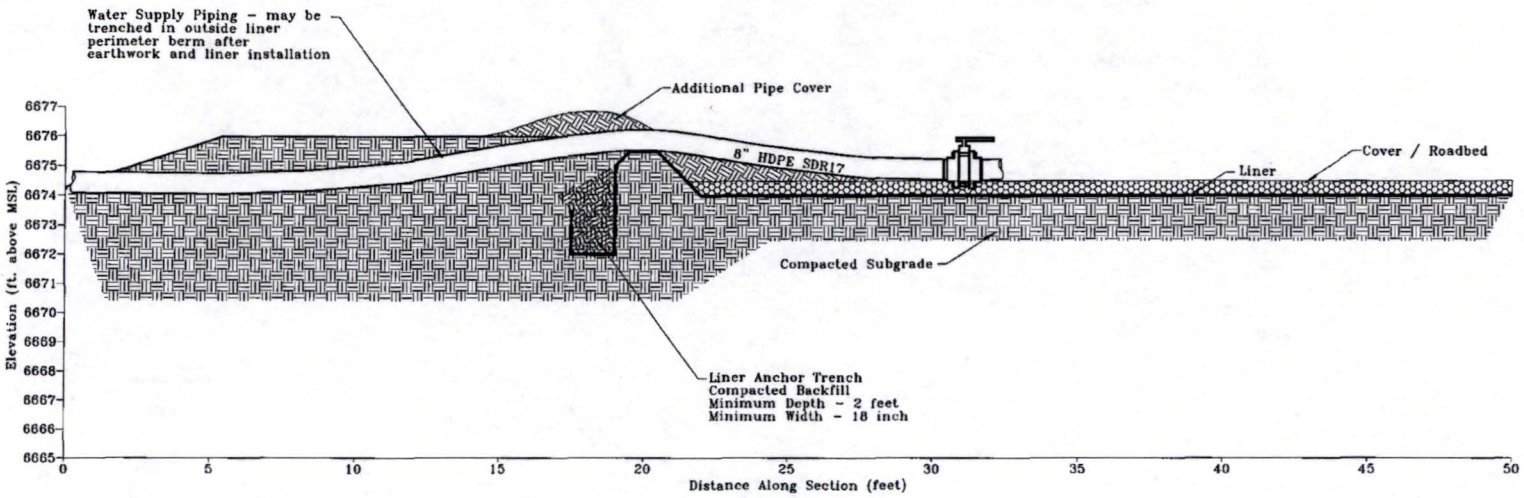
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

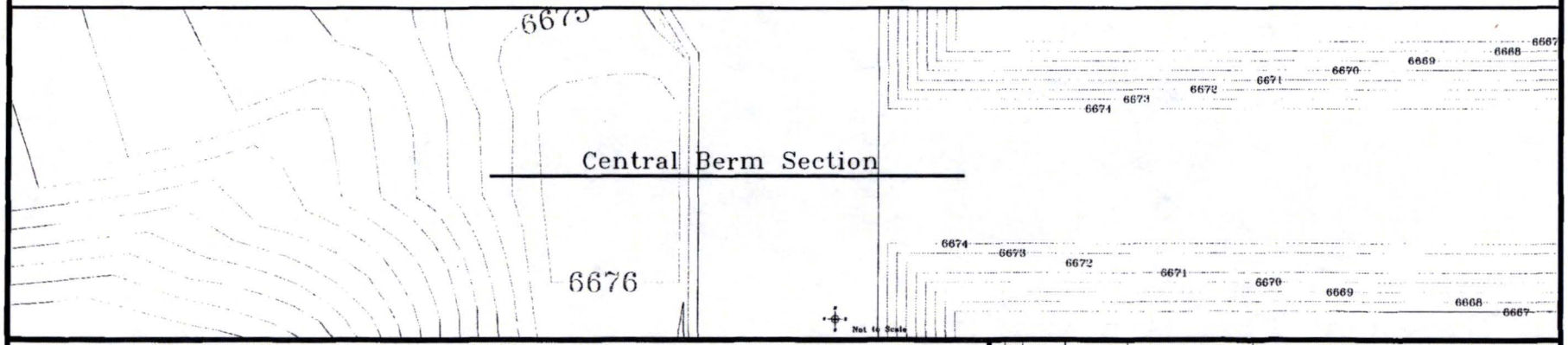
Pipe Trench, Regen Discharge, and Wye Filter Details

Sheet 41

Central Berm Section

Central Berm Liner and Perimeter Road Installation





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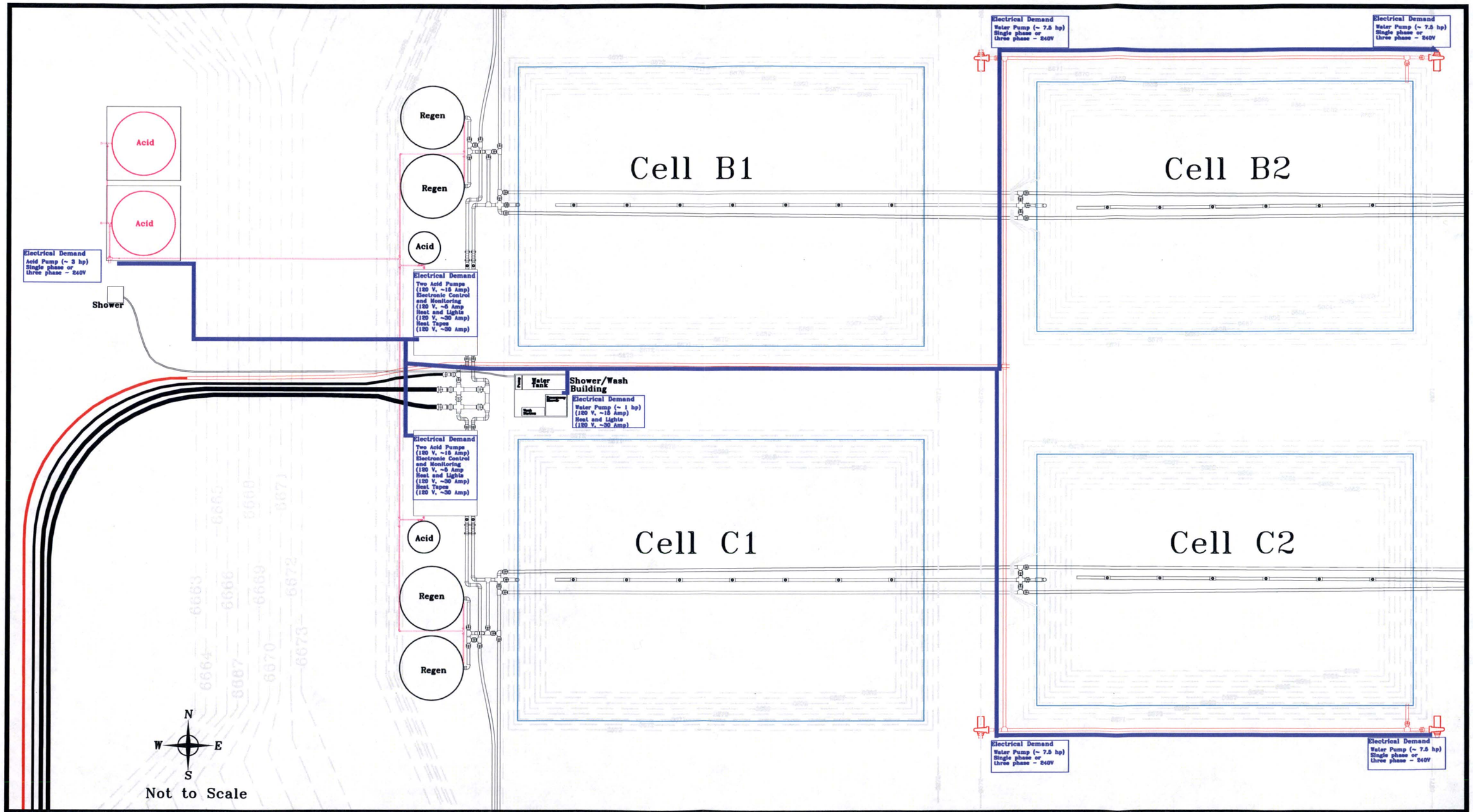
Homestake Mining Company
Grants, New Mexico
1200 GPM Zeolite System

Central Berm and Perimeter Road Configuration

Sheet 42

EXHIBIT B.2.4
Electrical Drawings



Legend

General Electrical Power Distribution

Description of Electrical Demand

REVISIONS No.	DATE	MADE BY	DESCRIPTION
1			
2			
3			
4			

DATE	DRAWN BY	CHECKED	APPROVED
3-2014	TGM		

Homestake Mining Company

Grants, New Mexico

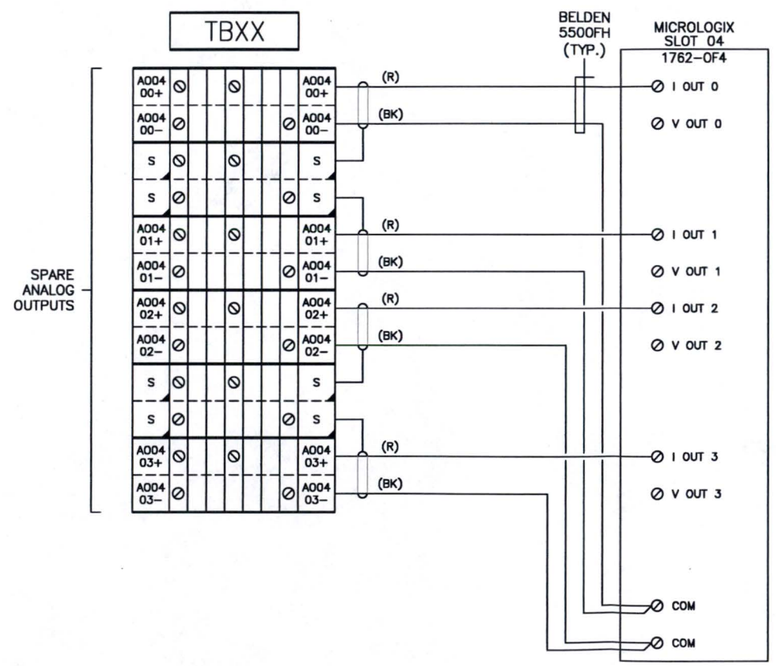
1200 GPM Zeolite System

General Electrical Distribution Layout

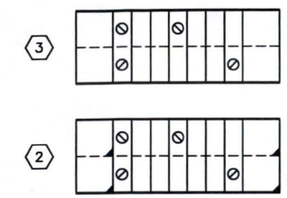
Sheet XXX of XXX

BILL OF MATERIALS

ITEM	COUNT	DESCRIPTION	MANUFACTURER	CATALOG
1	1	1762 MICRO LOGIX 1200 ANALOG OUTPUT	ALLEN BRADLEY	1762-OF4
2	2	DOUBLE LEVEL GROUND TERMINAL BLOCK, UTTB 4-PE	PHOENIX CONTACT	3044759
3	4	DOUBLE LEVEL TERMINAL BLOCK, UTTB 4	PHOENIX CONTACT	3044814
4	2	END ANCHOR, E/NS 35N	PHOENIX CONTACT	0800886
5	1	SPACER PLATE, DP-UTTB 2,5/4	PHOENIX CONTACT	3047303
6	1	PARTITION PLATE, ATP-UTTB 2,5/4	PHOENIX CONTACT	3047316

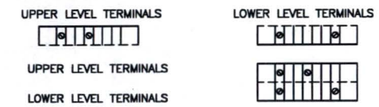


PROJECT SPECIFIC LEGEND



CONSTRUCTION NOTE:

DOUBLE LEVEL TERMINAL BLOCKS SHALL BE DEPICTED BY THE FOLLOWING TWO METHODS:



WIRE TYPE LEGEND:

- PANEL WIRING
- EXTERNAL BUT ON SKID
- FUTURE
- FIELD/BY OTHERS

GENERAL NOTES

- MAIN DISCONNECT AND BRANCH CIRCUIT BREAKER OR FUSE TO BE PROVIDED BY OTHERS.
- PANEL WIRING SHALL BE MTW RATED FOR 75°C TINNED, CU, UNLESS OTHERWISE NOTED.
- FIELD WIRING SHALL BE CU, RATED AT 60°C MINIMUM.
- CONDUIT HUBS SHALL BE OF SAME RATING AS ENCLOSURE.
- ALL CIRCUITS NEC CL2 UNLESS NOTED OTHERWISE

UL LISTED NITW.E142386

UL TORQUE SPECIFICATIONS

TERMINAL BLOCK, UTTB 4-PE – 0.6–0.8 Nm (5.31–7.08 in lbf)
TERMINAL BLOCK, UTTB 4 – 0.6–0.8 Nm (5.31–7.08 in lbf)

PRODUCTION AS-BUILT

NO.	DATE	REVISION	BY	DR.
4	5/18/17	PRODUCTION AS-BUILT	CG	EJ

CAD FILE: D34481-01 DATE: 5/18/17

DESIGNED: JJC DRAFTED: EJ
P.O. NO.:
SCALE: NONE

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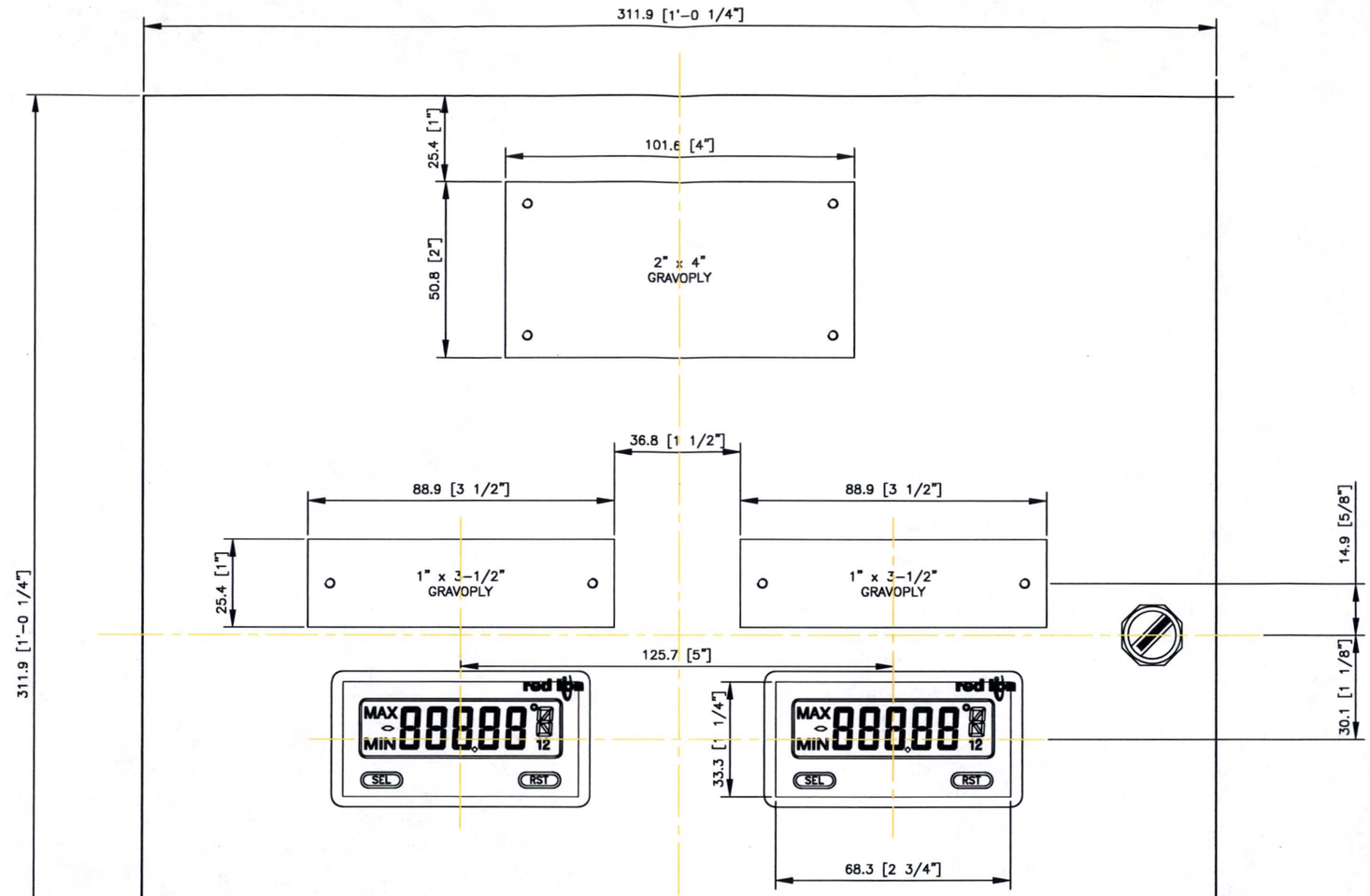
EMAIL: sales@autoelect.com

AUTOMATION & ELECTRONICS, INC.
CASPER WYOMING

TITLE: SWING ARM ANALOG OUTPUTS WIRING DIAGRAM

CUSTOMER: HOMSTAKE

SHEET 1 OF 1
JOB NO.: 9533-04_08
DRAWING NUMBER: D-34481
REV. A



ISSUED FOR CONSTRUCTION

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NO.	DATE	REVISION	BY	DR.
B	6/5/17	ISSUED FOR CONSTRUCTION	JJC	EJ
A	6/5/17	PRELIMINARY	JJC	EJ

CAD FILE: DR_D-34482 DATE: 6/5/17

DESIGNED: JJC DRAFTED: EJ

P.O. NO.:

SCALE: NONE

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EMAIL:
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AUTOMATION & ELECTRONICS, INC.
CASPER WYOMING

TITLE: STEINHAUER CNC HOFFMAN 12" x 12" DOOR CUTOUT A1212CHFL

CUSTOMER: AUTOMATION & ELECTRONICS

SHEET 1 OF 1

JOB NO.: 9533-03_08

DRAWING NUMBER: DR_D-34482

REV. B

BILL OF MATERIALS

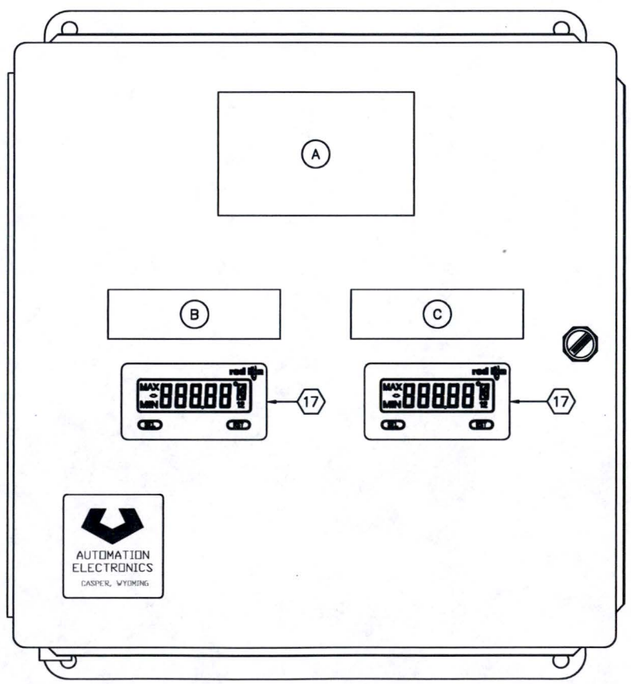
ITEM	COUNT	DESCRIPTION	MANUFACTURER	CATALOG
1	1	ENCLOSURE, 12X12X6, NEMA 12, LIGHT GRAY	HOFFMAN	A1212CHFL
2	1	BACK PANEL, 12X12, WHITE	HOFFMAN	A12P12
3	7	5x20mm 2 AMP FUSE – TIME DELAY	LITTELFUSE	239002.P
4	6	5x20mm 1 AMP FUSE – FAST ACTING	MERSEN	GGM1
5	7	5x20mm 1/2 AMP FUSE – FAST ACTING	MERSEN	GGM1/2
6	2	END ANCHOR, E/NS 35N	PHOENIX CONTACT	0800886
7	1	POWER SUPPLY, UNO–PS/1AC/24DC, 60W	PHOENIX CONTACT	2902992
8	2	2 POS. PLUG–IN BRIDGE, FBS 2–6	PHOENIX CONTACT	3030336
9	1	5 POSITION, CENTERLINE JUMPER, FBS 5–6	PHOENIX CONTACT	3030349
10	3	DC FUSE PLUG, P–FU 5X20 LED 24	PHOENIX CONTACT	3036819
11	2	AC FUSE PLUG, P–FU 5X20 LA 250	PHOENIX CONTACT	3036835
12	5	FUSIBLE TERMINAL BLOCK, UT 4–TG	PHOENIX CONTACT	3046142
13	12	TERMINAL BLOCK, UT 4–MTD	PHOENIX CONTACT	3046184
14	8	GROUND TERMINAL BLOCK, UT 4–MTD–PE/S	PHOENIX CONTACT	3046207
15	3	END COVER, D–UT 2,5/4–TWIN	PHOENIX CONTACT	3047141
16	1	USB OPTION CARD	RED LION	CUB5USB0
17	2	8–DIGIT MINIATURE DUAL COUNTER & RATE METER W/BACKLIT DISPLAY	RED LION	CUB5VB00
18	1	CIRCUIT BREAKER, 10A	SIEMENS	5SJ4110–7HG40
19	1	GROUND BUS BAR	SIEMENS	ECGB10

GENERAL NOTES

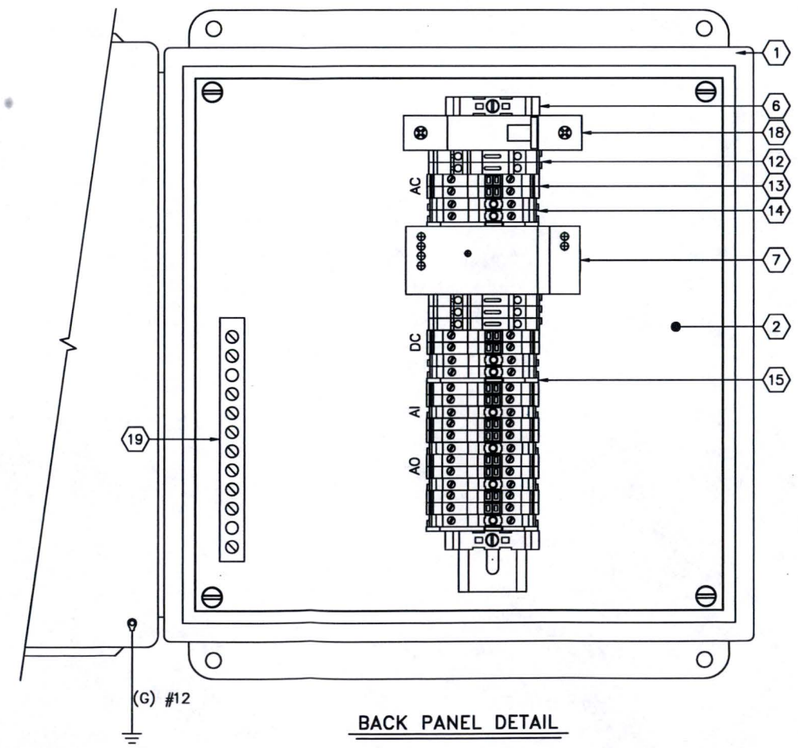
- MAIN DISCONNECT AND BRANCH CIRCUIT BREAKER OR FUSE TO BE PROVIDED BY OTHERS.
- PANEL WIRING SHALL BE MTW RATED FOR 75°C TINNED, CU, UNLESS OTHERWISE NOTED.
- FIELD WIRING SHALL BE CU, RATED AT 60°C MINIMUM.
- CONDUIT HUBS SHALL BE OF SAME RATING AS ENCLOSURE.
- ALL CIRCUITS NEC CL1 UNLESS NOTED OTHERWISE

UL TORQUE SPECIFICATIONS

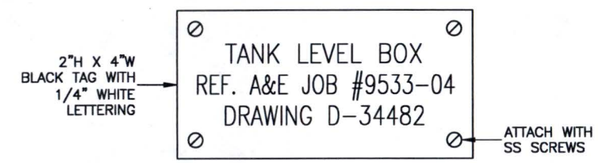
SIEMENS 5SJ4 SERIES CIRCUIT BREAKER	– 3.5 Nm (30.98 in lbf)
SIEMENS GROUND BUS BAR	– 2.7–3.3 Nm (23.90–29.20 in lbf)
TERMINAL BLOCK, UT 4–TG	– 0.6–0.8 Nm (5.31–7.08 in lbf)
TERMINAL BLOCK, UT 4–MTD	– 0.6–0.8 Nm (5.31–7.08 in lbf)
TERMINAL BLOCK, UT 4–MTD–PE/S	– 0.6–0.8 Nm (5.31–7.08 in lbf)



FRONT PANEL DETAIL

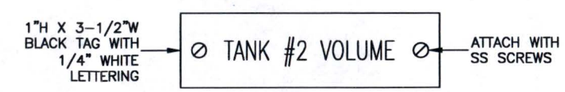


BACK PANEL DETAIL



DETAIL "A"

DETAIL "B"



DETAIL "C"

SHOP AS-BUILT

NO.	DATE	REVISION	BY	DR.
0	6/12/17	SHOP AS-BUILT	RMC	EJ

CAD FILE: D34482-01 DATE: 6/12/17

DESIGNED JJC DRAFTED EJ P.O. NO.: SCALE: NONE

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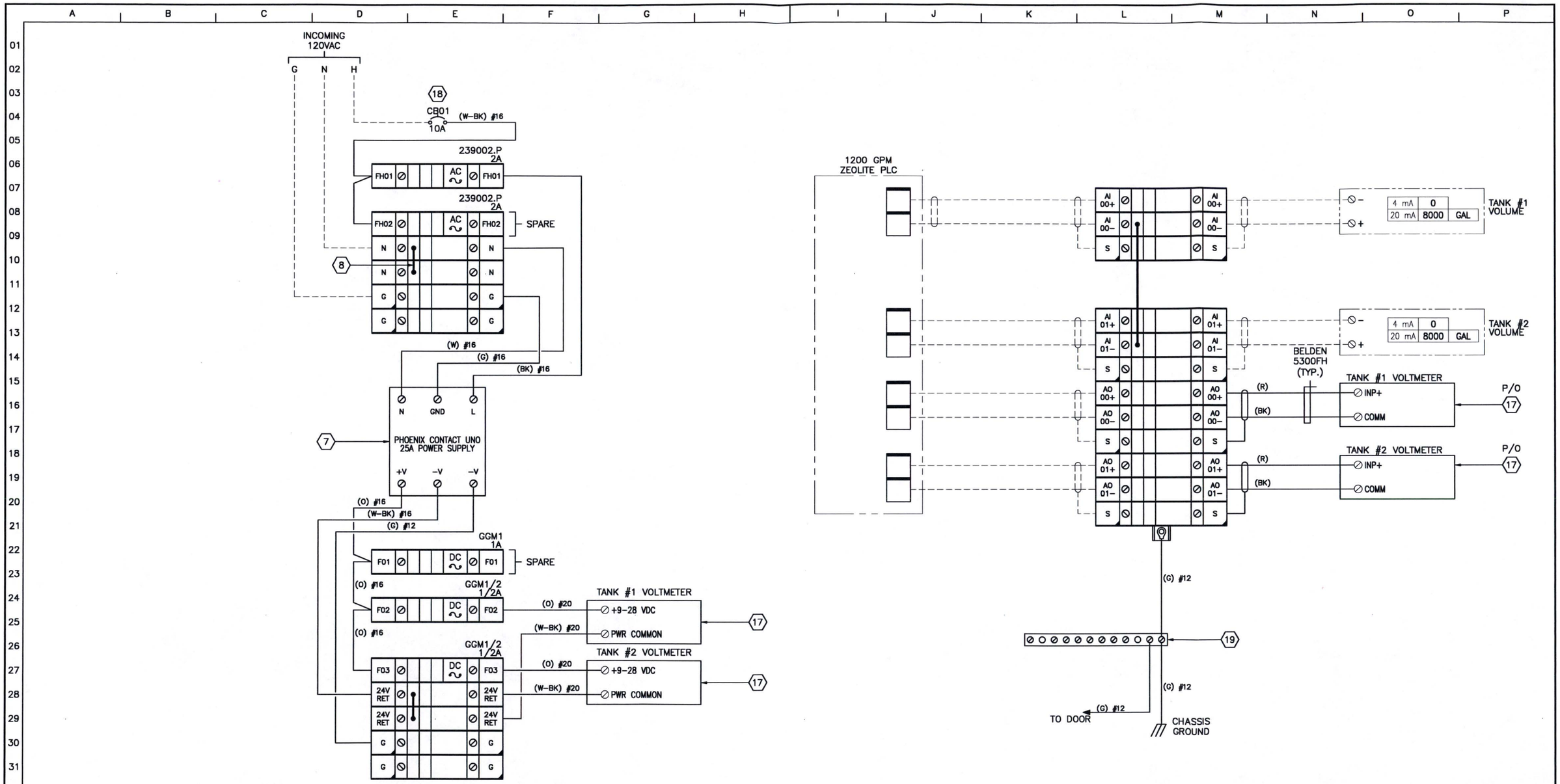
EMAIL: sales@autoelect.com

AUTOMATION & ELECTRONICS, INC.
CASPER WYOMING

TITLE: TANK LEVEL BILL OF MATERIALS & PANEL LAYOUT

CUSTOMER: HOMESTAKE

SHEET 1 OF 3 JOB NO.: 9533-04_08 DRAWING NUMBER: D-34482 REV. 0



WIRE TYPE LEGEND:

- -PANEL WIRING
- -EXTERNAL BUT ON SKID
- - FUTURE
- - FIELD/BY OTHERS

NOTE:

SEE SHEET 1 FOR BILL OF MATERIAL NOTES AND LEGEND

SHOP AS-BUILT

NO.	DATE	REVISION	BY	DR.
0	6/12/17	SHOP AS-BUILT	RMC	EJ

CAD FILE: D34482-02 DATE: 6/12/17

DESIGNED JJG DRAFTED EJ

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AUTOMATION & ELECTRONICS, INC.
CASPER WYOMING

TITLE: TANK LEVEL WIRING DIAGRAM

CUSTOMER: HOMESTAKE

SHEET 2 OF 3

JOB NO.: 9533-04_08

DRAWING NUMBER: D-34482

REV. 0

Mersen GGM Series	250VAC≤3A, 3A< 125VAC
Mersen ATDR Series	600VAC/300VDC
Mersen ATMR Series	600VAC/600VDC
Littelfuse 239 Series	250VAC≤3.5A, 3.5A< 125VAC
Littelfuse FLM Series	250VAC/125VDC
Littelfuse KLDR Series	600VAC/300VDC

SPARE FUSE BOX LIST		
QTY	PART	RATING
5	239002.P	2A
5	GGM1	1A
5	GGM1/2	1/2A

Automation Electronics

FUSE	SIZE	TYPE	PART	RATING
FH01	5x20MM	SLOW	239002.P	2A
FH02	5x20MM	SLOW	239002.P	2A
F01	5x20MM	FAST	GGM1	1A
F02	5x20MM	FAST	GGM1/2	1/2A
F03	5x20MM	FAST	GGM1/2	1/2A

JOB # 9533-04 / D-34482

SHOP AS-BUILT

NO.	DATE	REVISION	BY	DR.
0	6/12/17	SHOP AS-BUILT	RMC	EJ

CAD FILE: D34482-03 DATE: 6/12/17

DESIGNED JJG DRAFTED EJ

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EMAIL: sales@autoelect.com

AUTOMATION & ELECTRONICS, INC.
CASPER WYOMING

TITLE: TANK LEVEL FUSELIST

CUSTOMER: HOMESTAKE

SHEET 3 OF 3

JOB NO.: 9533-04_08

DRAWING NUMBER: D-34482

REV. 0

EXHIBIT B.2.5
Structural Stability and Settlement Assessment

Memorandum

To: Jess Toepfer

CC: Dam Kump

From: Alan Kuhn

Date: 3/17/2014

Re: COMMENTS ON GEOTECHNICAL ISSUES RELATED TO THE NEW ZEOLITE FACILITY ON THE LTP.

Following up on our conversation at the site on Wednesday, 3/12/2014 about the new zeolite treatment facility of the LTP, I've summarized below my observations and suggestions for locating and constructing the zeolite cells and the effects of this facility on the stability of the LTP.

Zeolite Cell Settlement

From the plan view that Dan showed to me, it appears that the location of the cells would be near the southeast corner of the top of the LTP, within about 30 feet of the top of the outslope. When the contaminated windblown soils were excavated from the site and surrounding area in 1994-1995, those soils were placed against the (then existing) east slope of the LTP. As I recall, this extended the east side of the LTP for several hundred feet eastward. Knight Piesold QC records or pre-closure vs current topography should provide data to check this. If I am correct, the LTP material underlying the proposed zeolite cell location consists of moderately compacted (scraper traffic and dozer tracking) soil consisting of sand, silt and some clay and, perhaps at the bottom, tailing sand. There should be no slimes below the zeolite cells. In this case the soil profile below the cells has no material that would consolidate and lead to settlement.

When loaded with zeolite and water, the cells will exert a surcharge load of 130-150 psf per foot of cell height on the interim cover. Some densification in response to the surcharge could occur in the interim cover, which was placed with less compactive effort (90% or less of maximum) than the outslope cover. This densification would probably occur during construction and initial cell loading and would probably cause only small (fraction of inch), fairly uniform surface settlement that should not negatively impact the cells. I do not think that field investigations such as test borings are warranted, given what is known about the properties of the soils underlying the cell location.

Zeolite Cell Location

The tops of the LTP slopes, especially the interface with the interim cover, is the Achilles of the LTP until the final cover and riprap are placed. HMC has seen this in the several instances when extreme rainfall running off the interim cover, which is not designed for long-term hydrologic performance,

has caused some localized disruption on the outslope cover. To control possible similar events in the future, access around the top of the outslopes should be maintained so that runoff can be directed as needed and maintenance crews can have room to work on those problems that occur. Separation between the cells and the outslope is needed to provide space to manage surficial leaks from the cells and to minimize the risk that cell leakage would infiltrate into and saturate the upper outslope cover. For these reasons, I recommend that the cells be located not closer than 100 feet from the top of slope.

LTP stability

The surcharge from the cells will have negligible effect on LTP slope stability, for which the factors of safety are already high. The stability analysis performed in 2010 is still valid; the configuration and properties contributing to LTP stability have not changed since then. The only factor that has been changing is the phreatic surface, which changes with the pile flushing patterns. The 2010 stability analysis took this into account; it incorporated the assumption that the tailing were completely saturated and the phreatic surface was at the base of the outslope cover. Even in this extreme condition, the LTP would have factors of safety well above the safe minimums against global failures in the form of large-scale translational or rotational mass movements of the slopes.

Elevated phreatic surfaces in the outslopes are a concern for small-scale, shallow local slips or slumps in the LTP slopes **that would breach the cover. For this reason, I've recommended in each recent annual engineer's report that the flushing program be conducted so that the phreatic surface** in the outslopes is kept at least 10 feet below the cover.

Slope stability is not impacted by the location of the zeolite facility except as noted above with respect to runoff controls, which is an issue of erosional stability rather than structural stability of the LTP slopes.

KLEINFELDER
Bright People. Right Solutions.

January 21, 2010
File No.: 16977.07.2-ALB10RP001

Mr. Al Cox
Homestake Mining Company of California
P.O. Box 98
Grants, NM 87020

SUBJECT: STABILITY ANALYSIS OF THE LARGE TAILING IMPOUNDMENT HOMESTAKE GRANTS PROJECT GRANTS, NEW MEXICO

Dear Mr. Cox:

On December 7, 2009 the undersigned submitted the report of the annual visual inspection of the tailing impoundments and evaporation ponds at the Homestake Grants Project located at Grants, New Mexico. As the Responsible Engineer for these impoundments, I am required to annually inspect the stability and functionality of the impoundments. One of the recommendations in my report was

"The slope stability analysis of the large impoundment should be updated this year because of the substantial rise in the saturated zone within the tailings"

Subsequent to that report, you requested that I perform the recommended stability analysis. That analysis has been completed, and this letter reports the results. Stability analysis was performed on cross-sections of the north and south slopes of the impoundment. The analyzed cross-sections are north-south lines that intercept piezometers CN1 and CS1 on the north and south slopes, respectively (Figure 1).

The computer code SLIDE was used to perform the analysis of each slope. Input parameters included the tailing and cover properties used in the tailing closure design contained in *Reclamation Plan, Homestake Mining Company of California Grants Operation, 10/93, Vol. 1 and 2.* The computer models were run with a seismic coefficient of 0.1, representing the worst-case load that would be imposed by the design earthquake with a peak ground acceleration of 0.1g. The model also included a phreatic surface at the base of the radon barrier below the most recently measured piezometric elevations in CN1 and CS1, as depicted in the attached figures.

The potential failure surface limits were set to search 1) potential global failure surfaces throughout the entire length of slope as well as above the top and below the toe of the slope (Figure 2 and 3) and 2) shallower potential failure surfaces within the slope (Figures 4 and 5). The attached figures display the potential failure surface with the lowest factors of safety, rounded to the nearest tenth, against rotational failure in each slope analysis. The lowest factors of safety for the north slope section are 2.0 and 2.3 for deep-seated global slope failure and for shallower failures within the slope,

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respectively. The lowest factors of safety for the south slope section are 1.8 and 2.1 for deep-seated global slope failure and for shallower failures within the slope, respectively. All of these factors of safety are well above the minimum required value of 1.0.

The results of the slope stability analysis indicate that the rise in phreatic levels associated with the tailing flushing program has not reduced the stability of the slopes, as predicted by the SLIDE stability modeling, at these locations below factors of safety consistent with license conditions and closure design.

This stability analysis did not address the potential for seeps of tailing water to the surface of the slopes. Such seeps can occur if the phreatic levels intercept the slope surface and should be avoided by limiting injection of water in wells close to the impoundment slopes.

Please contact me if you have any questions regarding the slope stability analysis.

Respectfully submitted,
KLEINFELDER WEST, INC.

Alan K. Kuhn

Alan K. Kuhn, Ph.D., P.E., R.G.
Senior Principal Consultant

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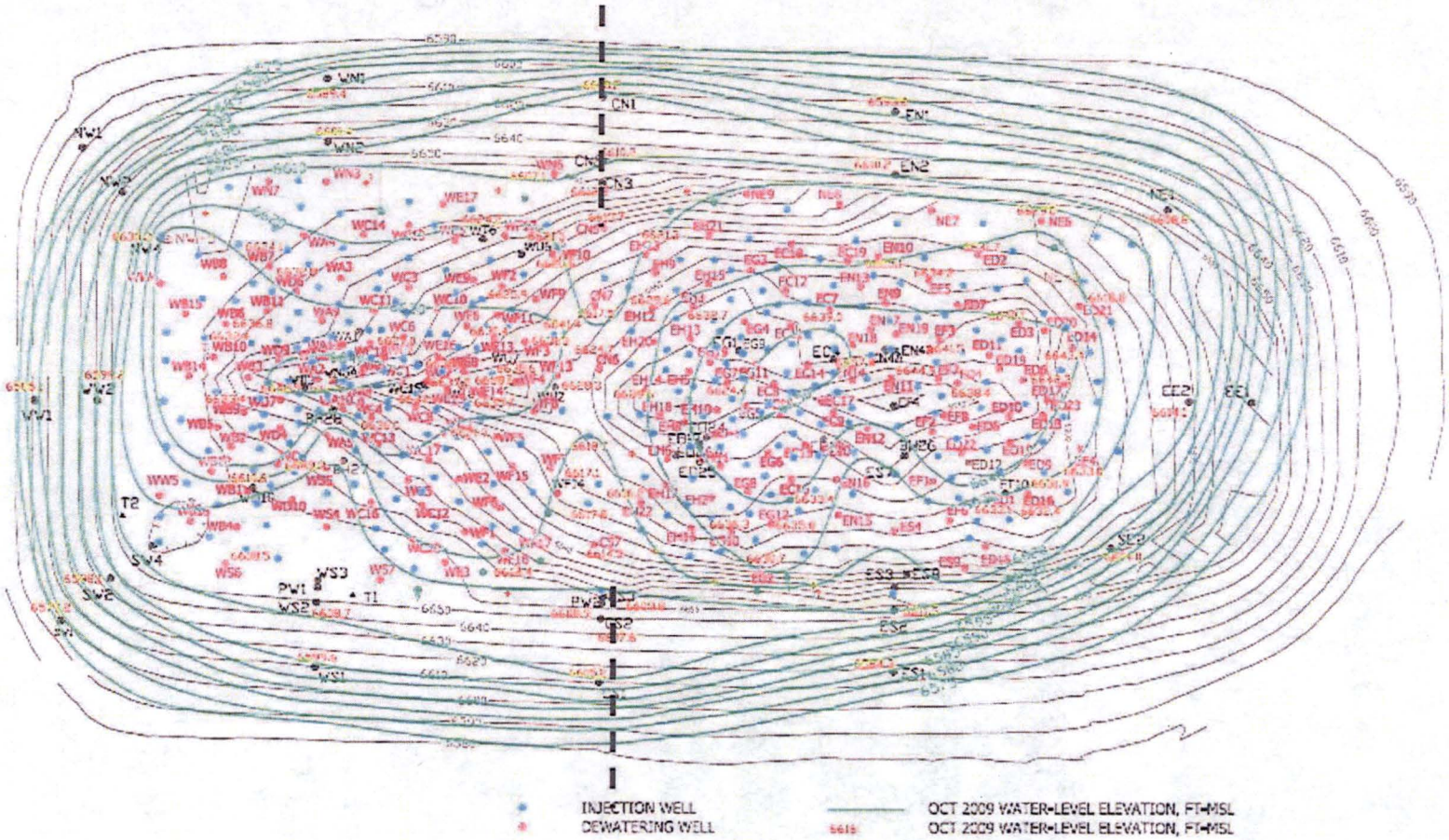


Figure 1 – Locations of CN1 and CS1 Cross-sections of Large Tailing Impoundment

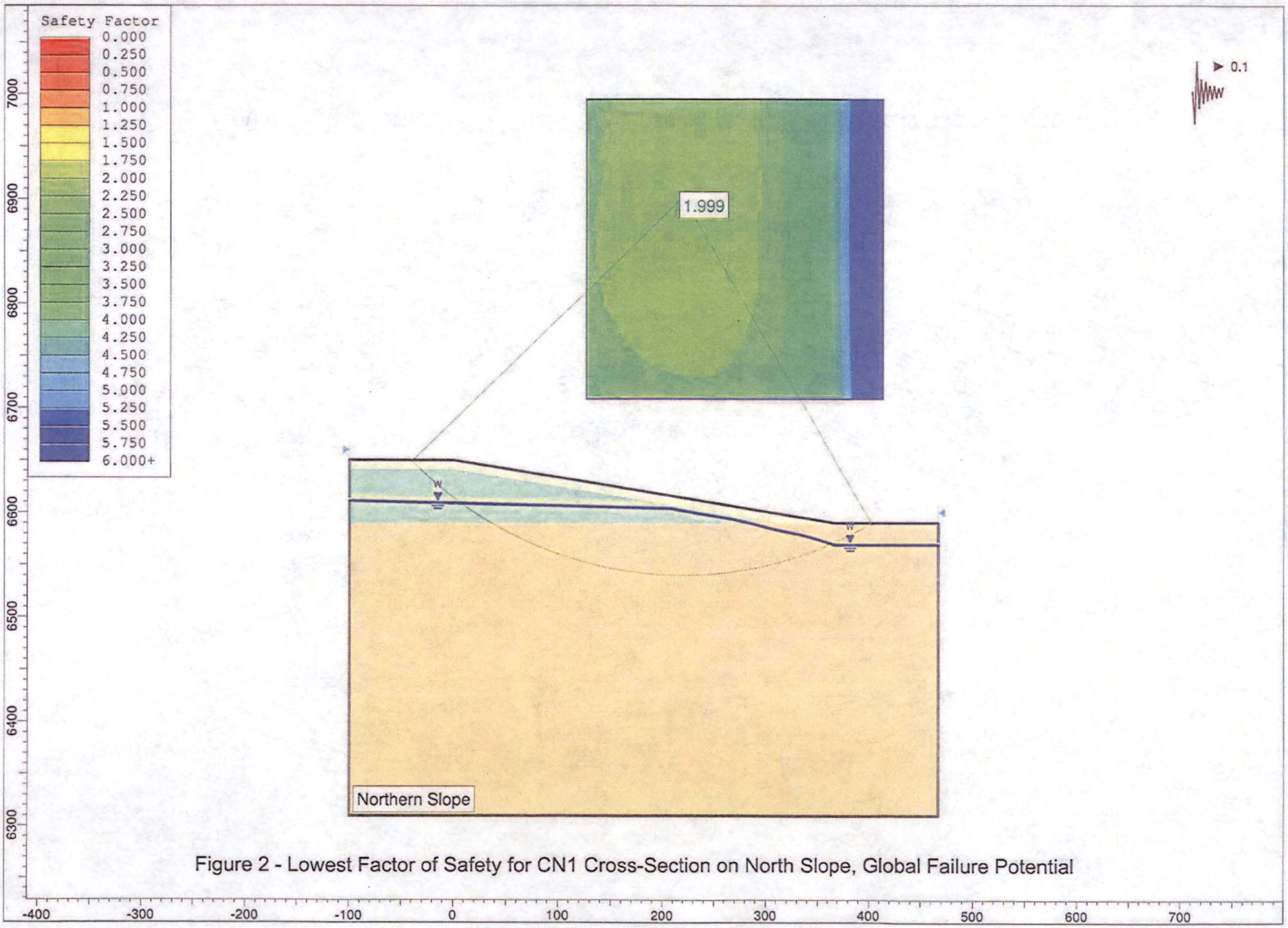


Figure 2 - Lowest Factor of Safety for CN1 Cross-Section on North Slope, Global Failure Potential

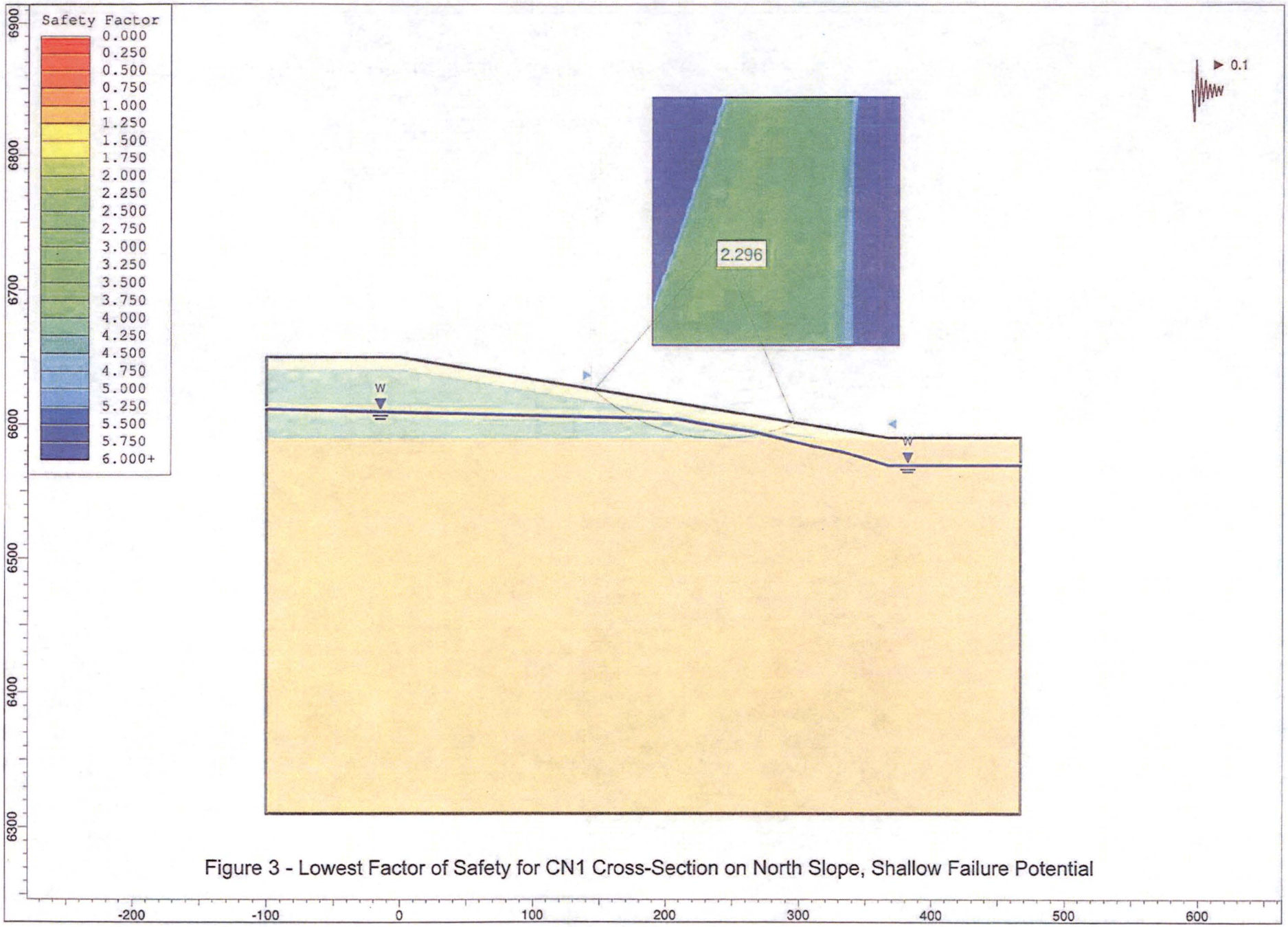


Figure 3 - Lowest Factor of Safety for CN1 Cross-Section on North Slope, Shallow Failure Potential

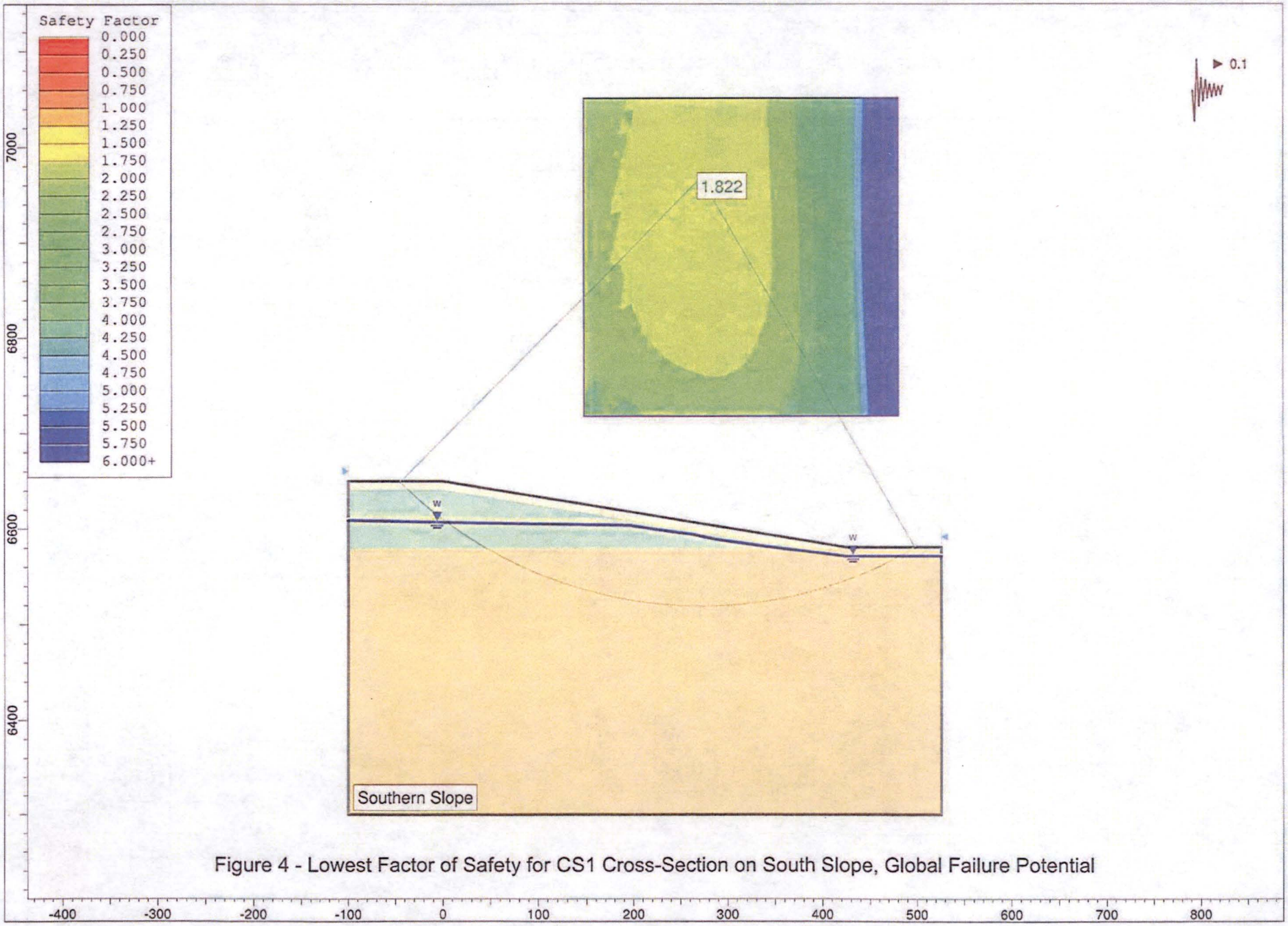


Figure 4 - Lowest Factor of Safety for CS1 Cross-Section on South Slope, Global Failure Potential

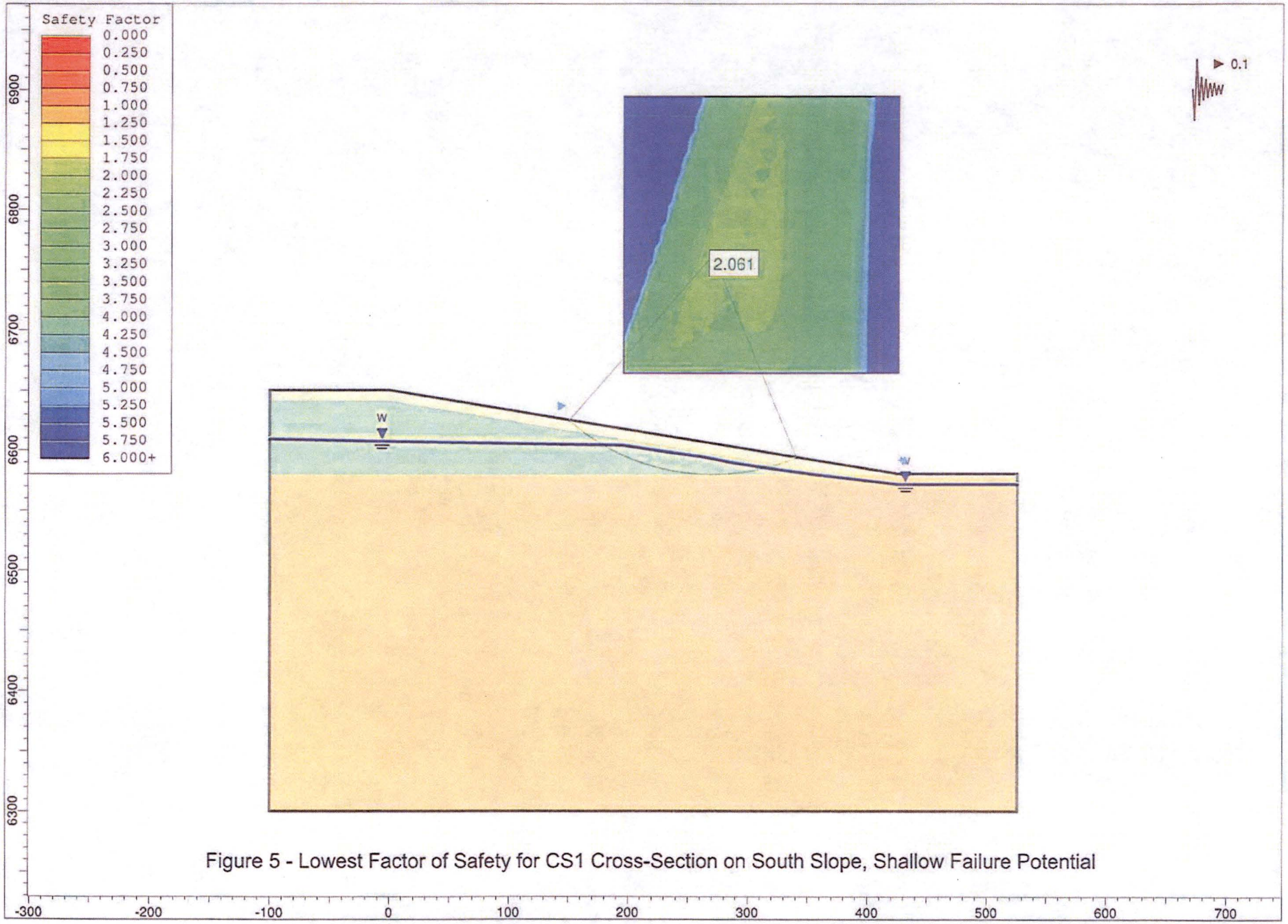
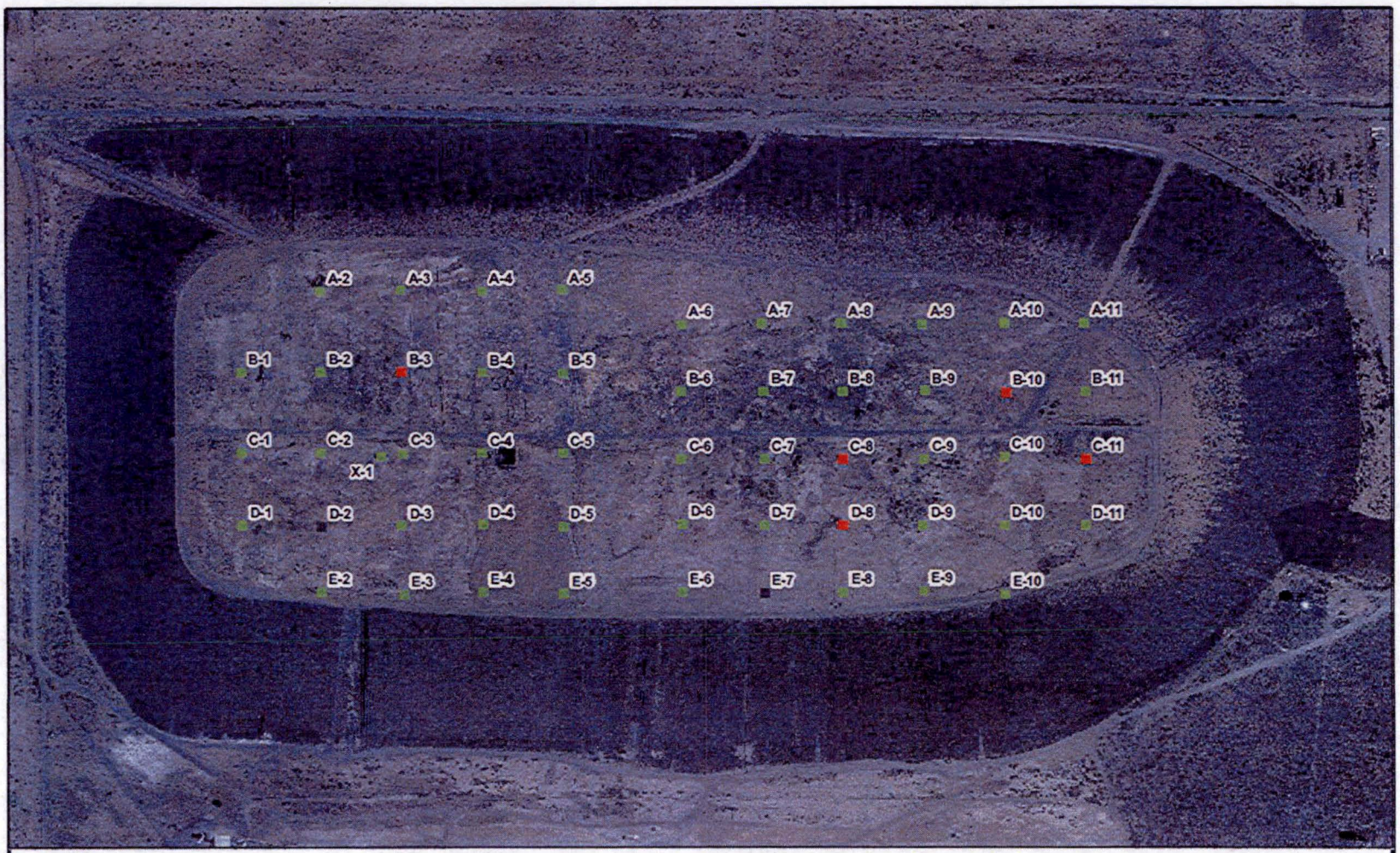


Figure 5 - Lowest Factor of Safety for CS1 Cross-Section on South Slope, Shallow Failure Potential



LEGEND:

Status

- Operating
- Damaged
- Destroyed

Aerial Source:
2011 High Resolution Aerials from HMC.

N

0 250 500 Feet

GRANTS RECLAMATION PROJECT
Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-8
SETTLEMENT MONITORING POINT LOCATIONS

Table 2.2-4 Yearly Variations of Settlement Point Monitoring Data Measurements 2001 – 2011

Settlement Point No.	Change in Elevation (feet amsl)										
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
X-1	0.10	0.11	-0.05	-0.04	0.21	-0.07	-0.03	0.09	-0.16	-0.05	-0.33
B-1	0.06	0.09	-0.04	0.02	0.01	0.06	-0.12	0.13	-0.16	0.17	-0.10
C-1	0.07	0.10	-0.05	0.02	0.03	0.06	-0.09	0.13	-0.16	-0.01	-0.27
D-1	0.10	0.05	-0.05	0.02	0.03	0.06	-0.16	0.14	-0.16	0.02	-0.26
A-2	0.05	0.07	-0.02	0.04	0.01	-0.14	0.05	0.16	-0.17	0.19	-0.10
B-2	0.10	0.09	-0.04	0.02	0.01	0.06	-0.02	0.11	-0.14	0.16	-0.12
C-2	0.10	0.07	-0.06	0.06	-0.04	0.05	0.00	0.16	-0.20	-0.03	-0.30
D-2	0.07	0.08	-0.04	0.05	-0.07[a]	2.28[d]	0.32	0.12	-0.14	0.0[d]	[c]
E-2	0.07	0.07	-0.03	0.02	0.03	-0.04	-0.05	0.16	-0.17	0.11	-.016
A-3	0.06	0.13	-0.06	-0.01	0.05	1.87[b]	0.06[b]	-1.86	-0.14	0.15	-0.10
C-3	0.06	0.10	-0.03	-0.04	0.20	-0.07	0.00	0.10	-0.14	-0.05	-0.33
D-3	0.06	0.13	-0.05	-0.03	0.06	0.12	-0.05	0.09	-0.07	-0.03	-0.22
E-3	0.01	0.11	-0.05	-0.02	0.05	-0.06	-0.05	0.11	-0.12	0.07	-0.14
A-4	0.04	0.14	-0.06	0.02	0.09	-0.27	0.18	0.10	-0.10	0.18	-0.07
B-3	0.08	0.12	0.03	0.00	0.05	0.09	[c]	[c]	[c]	[c]	[c]
B-4	0.04	0.14	-0.01	-0.04	0.07	-0.04	-0.01	0.07	-0.11	0.12	-0.14
C-4	0.39	0.17	-0.04	-0.13	0.16	-0.07	0.04	0.11	-0.14	0/0	-2.3 [e]
D-4	0.04	0.15	-0.05	-0.13	0.15	-0.02	-0.02	0.11	-0.09	0.01	-0.23
E-4	0.04	0.18	-0.02	-0.12	0.49	-0.13	0.07	0.13	-0.12	0.10	-0.14
A-5	0.03	0.16	-0.00	-0.13	0.04	-0.08	0.04	0.12	-0.14	0.16	-0.06
B-5	0.05	0.11	-0.06	-0.16	0.12	0.12	-0.04	0.10	-0.13	0.20	-0.12
C-5	0.10	0.10	-0.03	-0.02	-0.07	0.17	-0.04	0.07	-0.13	0.16	-0.06
D-5	0.09	0.08	0.01	-0.18	0.12	0.09	-0.05	0.10	-0.08	0.02	-0.23
E-5	0.07	0.09	0.01	-0.03	0.02	-0.13	0.04	0.13	-0.09	0.10	-0.04
A-6	0.01	0.14	-0.03	-0.10	0.04	-0.06	0.06	1.09	-0.09	0.14	-0.06
B-6	0.05	0.15	-0.04	-0.09	0.04	0.08	-0.03	0.11	-0.10	0.16	-0.07
C-6	0.06	0.14	-0.08	0.06	-0.12	0.05	0.05	0.11	-0.11	0.17	-0.07
D-6	0.03	0.03	-0.03	0.06	-0.10	0.09	-0.03	0.12	-0.09	0.03	-0.23
E-6	0.03	0.10	-0.01	0.02	-0.07	-0.19	0.17	0.09	-0.09	0.09	-0.12
A-7	0.02	0.07	0.02	-0.01	-0.05	0.02	-0.01	0.15	-0.16	0.24	0.03
B-7	0.01	0.09	0.03	0.03	-0.08	0.10	-0.03	0.14	-0.13	0.23	0.01
C-7	0.05	0.09	0.04	-0.05	-0.02	0.10	-0.04	0.16	-0.18	0.21	-0.04
D-7	0.04	0.06	0.06	-0.04	-0.03	0.11	-0.08	0.15	-0.13	-0.11	-0.24
D-8	[c]	[c]	[c]	[c]	[c]	[c]	[c]	[c]	[c]	[c]	[c]
E-7	0.02	0.08	0.04	-0.03	-0.05	-0.07	0.11[d]	0.06	-0.12[d]	0.09[d]	-0.13[d]
A-8	0.05	0.07	0.04	0.01	-0.11	0.01	0.03	0.16	-0.14	0.16	-0.06
B-8	0.07	0.04	0.04	-0.02	-0.09	0.12	0.00[b]	0.14	-0.15	0.19	-0.05
C-8	0.04	0.03	0.03	-0.02	-0.07	0.15	-0.07	[c]	[c]	[c]	[c]

Table 2.2-4 Yearly Variations of Settlement Point Monitoring Data Measurements 2001 – 2011

Settlement Point No.	Change in Elevation (feet amsl)										
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
E-8	0.02	0.07	0.03	0.00	-0.10	0.02	0.03	0.13	-0.13	0.09	-0.13
A-9	-0.02	0.13	0.00	0.00	-0.13	0.00	0.07	0.16	-0.13	0.15	-0.06
B-9	1.15	0.13	-0.02	-0.01	-0.14	0.13	-0.02	0.19	-0.15	0.19	-0.05
C-9	-0.01	0.05	0.06	-0.03	-0.17	0.15	0.03	0.17	-0.17	0.20	-0.06
D-9	0.00	-0.23	0.03	0.02	-0.17	0.13	-0.01	-0.82	-0.15	0.06	-0.19
E-9	-0.02	0.31	-0.19	0.01	-0.15	-0.04	0.06	0.18	-0.16	0.09	-0.12
A-10	-0.11	0.11	0.00	0.01	-0.05	0.01	-0.01	0.19	-0.19	0.16	-0.07
B-10	-0.03	0.09	0.00	0.01	-0.01	[c]	[c]	[c]	[c]	[c]	[c]
C-10	0.00	0.09	0.00	-0.01	-0.02	0.13	-0.03	0.18	-0.18	0.18	-0.08
D-10	0.01	0.07	0.01	0.01	-0.01	0.11	-0.05	0.21	-0.15	0.07	-0.17
E-10	-0.11	0.10	0.01	0.04	-0.05	-0.11	0.06	0.21	-0.19	0.09	-0.13
A-11	-0.10	0.12	0.01	0.01	-0.02	-0.04	-0.01	0.19	-0.19	0.14	-0.08
B-11	-0.10	0.11	0.00	0.00	-0.02	0.08	-0.03	0.16	-0.18	0.16	-0.07
C-11	-0.09	0.10	-0.01	-0.03	-0.02	0.05	-0.03	0.19	[c]	[c]	[c]
D-11	-0.09	0.03	0.05	-0.01	-0.03	0.05	-0.07	0.17	-0.18	0.08	-0.10

Notes:

Table denotes differences in settlement measurements by comparing readings to the previous year.

[a] D-2 Monument broken (top elevation = 9995.29, broken piece = 2.21; reported elevation = 6657.50)

[b] Monument broken, shot taken at top of broken piece

[c] Destroyed – missing

[d] Damaged – loose and leaning

[e] C-4 broken; located at break

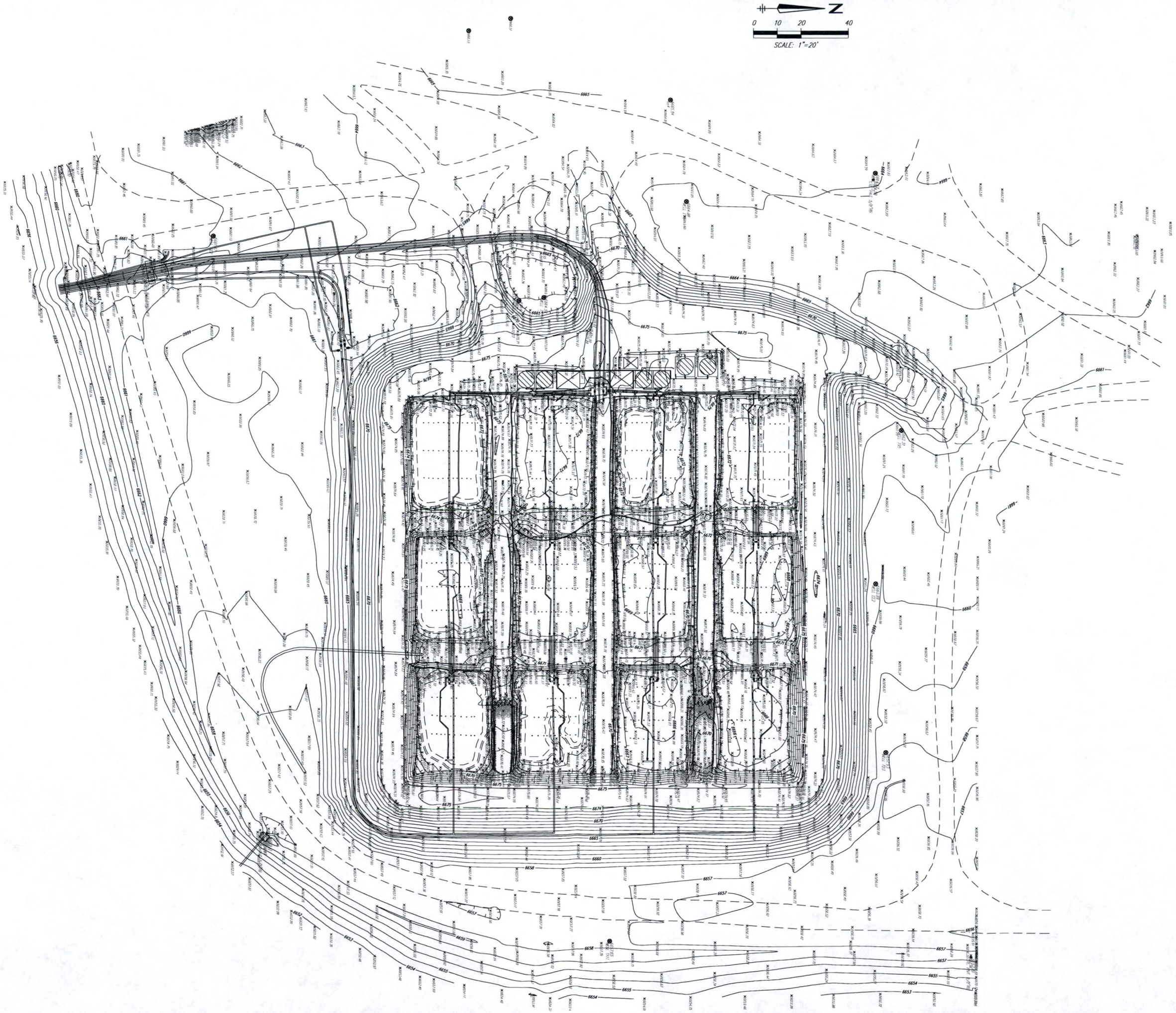
amsl – above mean sea level

Source: Letter from Strachan, C. MFG Consulting Scientists and Engineers to A. Cox, Homestake Mining Company Regarding *Homestake Grants Large Tailings Impoundment, Review of 2003 Settlement Monitoring Data.* December 22, 2003 [for 2000 – 2003 data]

Souder, Miller & Associates. Individual monitoring data sheets for years 2004 – 2010, 2010-2011

EXHIBIT B.2.6
Construction As-Built Data

- 1200 Zeolite System As-Built Topographic Survey
- Pad and Perm Compaction and Density and Pad Density Testing
- Sierra Geotechnical Services Liner Construction Field Data Completion Report
- Pre-qualification test seam results
- Field Seam Non-Destructive Testing
- Destructive Field Seam Testing
- Daily Field Installation Reports


N
0 10 20 40
SCALE: 1"=20'

Homestake Mining Company of California

RECORD OF CONTINUAL TRAINING

Date(s) Training Was Given: 3-16-15

Name of Training Course / Subject Material: Accepting Radios From HMC

Facilitator: (PRINT) Kyle Martinez (SIGN) [signature]

Topics Discussed: Coyote is using radio's provided by HMC and will return radio's in same condition they recieved them in Two radio's with charger were provided.

Attendees:

Print: Bill Power Sign: [signature] Date: 3/16/15

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Homestake Mining Company P.O. Box 98, Grants, NM 87020 Tele: (505) 287-4456 Fax: (505) 287-9289

Homestake Mining Company of California

RECORD OF CONTINUAL TRAINING

Date(s) Training Was Given: 3-23-15

Name of Training Course / Subject Material: Signing for Radio's

Facilitator: (PRINT) Kyle Martinez (SIGN) [signature]

Topics Discussed: Weston Bohannon signed for 8 new motorola radio's for dirt work for 1200 Zeolite System All radios must be returned in condition they were recieved

Attendees:

Print: Weston Bohannon Sign: [signature] Date: 3/23/15

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Print: Sign: Date:

Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-579-00964 Phase: Task: Machine No: 37046
Project: Zeolite Pond Project Date Tested: 3/20/15
Client: Coyote Drilling Tested By: Jonathan Marquez
Contractor: To be used for: Perimeter Berm Fill
A / E:

Test No.	1	2	3	4				
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)	D	→	→	→				
Probe Depth	6	→	→	→				
Moisture (cpm)								
Density (cpm)								
Air Gap (cpm)								
Ratio								
Wet Density (pcf)	121.3	125.3	122.3	121.9				
Moisture (pcf)	12.5	14.3	14.2	13.7				
Dry Density (pcf)	108.8	111.0	108.1	108.2				
Max Dry Density	112.5	→	→	→				
% Compaction	97	99	96	96				
% Compaction Required	95+	95+	95+	95+				
% Moisture	11.5	12.9	13.2	12.7				
% Moisture Required (+/-)	2 2	2 2	2 2	2 2				
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes				

Proctors			Test No.	Location / Elevation		
Lab #	Density	Moisture	1	West Perimeter Berm Between Grid Lines A+B @ Cell B-1	Lot:	Lift:
A-3	112.5	12.7			Elevation:	-10' FSG
			2	North Perimeter Berm Grid Line G @ Cell A2	Lot:	Lift:
					Elevation:	-13' FSG
			3	East Perimeter Berm Between Grids B+C @ Cell C3	Lot:	Lift:
					Elevation:	-16' FSG
			4	South Perimeter Berm Grid Line G @ Cell D-2	Lot:	Lift:
					Elevation:	-13' FSG
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	

VERBAL

Remarks: Office
~~[illegible]~~ 821-1801

Std. Cnt.	Cali.	Field
Density:		
Moisture:		

AMEC Environment & Infrastructure, Inc
8519 Jefferson NE
Albuquerque, NM 87113
Tel (505) 821-1801 Fax (505) 821-7371

amec

Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-519-00904 Phase: Task: Machine No: 5704 C
Project: Zeolite Pond Project Date Tested: 3/23/15
Client: Cobre Mining Tested By: Jonathan M.
Contractor: To be used for: Perimeter Berm Fill
A / E:

Test No.	1	2	3	4				
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)	D	→	→	→				
Probe Depth	6	→	→	→				
Moisture (cpm)								
Density (cpm)								
Air Gap (cpm)								
Ratio								
Wet Density (pcf)	123.5	125.9	123.1	122.7				
Moisture (pcf)	15.5	15.1	12.9	14.4				
Dry Density (pcf)	108	110.3	110.2	108.3				
Max Dry Density	112.5	→	→	→				
% Compaction	96	98	98	96				
% Compaction Required	95+	→	→	→				
% Moisture	19.9	13.6	11.7	13.3				
% Moisture Required (+/-)	2 / 2	2 / 2	2 / 2	2 / 2				
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes				

Proctors			Test No.	Location / Elevation		
Lab #	Density	Moisture	1	East Perimeter Berm Grid Line B @ Cell B3	Lot:	Lift:
A-3	112.5	12.7			Elevation: -15' FSG	
			2	South Perimeter Berm Grid Line H	Lot:	Lift:
					Elevation: -12' FSG	
			3	West Perimeter Berm Grid Line D @ Cell D1	Lot:	Lift:
					Elevation: -9' FSG	
			4	North Perimeter Berm Grid Line C @ Cell A1	Lot:	Lift:
					Elevation: -12' FSG	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	

Vestal

Remarks:	Std. Cnt.	Cali.	Field
	Density:		
	Moisture:		

AMEC Environment & Infrastructure, Inc.
8519 Jefferson NE
Albuquerque, NM 87113
Tel (505) 821-1801 Fax (505) 821-7371

amec

Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-519-00904 Phase: Task: Machine No: 37046

Project: Zeolite Pond Project Date Tested: 3/23/15

Client: Coyote Drilling Tested By: Jonathan M.

Contractor: To be used for: Perimeter Berm Fill

E:

Test No.	1	2	3	4				
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)	D	→	→	→				
Probe Depth	6	→	→	→				
Moisture (cpm)								
Density (cpm)								
Air Gap (cpm)								
Ratio								
Wet Density (pcf)	123.5	125.4	123.1	122.7				
Moisture (pcf)	15.5	15.1	12.9	14.4				
Dry Density (pcf)	108	110.3	110.2	108.3				
Max Dry Density	112.5	→	→	→				
% Compaction	96	98	98	96				
% Compaction Required	95+	→	→	→				
% Moisture	14.4	13.6	11.7	13.3				
% Moisture Required (+ / -)	2-2	2-2	2-2	2-2				
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes				

Proctors			Test No.	Location / Elevation		
Lab #	Density	Moisture				
3	112.5	12.7	1	East Perimeter Berm Grid line B @ Cell B3	Lot: Lift: Elevation: -15' FSG	
			2	South Perimeter Berm Grid line H	Lot: Lift: Elevation: -12' FSG	
			3	West Perimeter Berm Grid line D @ Cell D1	Lot: Lift: Elevation: -9' FSG	
			4	North Perimeter Berm Grid line F @ Cell A1	Lot: Lift: Elevation: -12' FSG	
Verbal					Lot: Lift: Elevation:	
					Lot: Lift: Elevation:	
					Lot: Lift: Elevation:	
					Lot: Lift: Elevation:	

Remarks:

Std. Cnt.	Cali.	Field
Density:		
Moisture:		

AMEC Environment & Infrastructure, Inc.
8519 Jefferson NE
Albuquerque, NM 87113
Tel (505) 821-1801 Fax (505) 821-7371

amec

Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: Phase: Task: Machine No:

Project: Date Tested:

Client: Tested By:

Contractor: To be used for:

E:

Test No.								
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)								
Probe Depth								
Moisture (cpm)								
Density (cpm)								
Air Gap (cpm)								
Ratio								
Wet Density (pcf)								
Moisture (pcf)								
Dry Density (pcf)								
Max Dry Density								
% Compaction								
% Compaction Required								
% Moisture								
% Moisture Required (+ / -)								
Meets Specifications (Yes / No)?								

Proctors			Test No.	Location / Elevation		
Lab #	Density	Moisture			Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	

Verbal

Remarks:	Std. Cnt.	Cali.	Field
	Density:		
	Moisture:		

Date of Preparation September 15, 1992
Revision #5 Date revised: April 7, 2005

AMEC Earth & Environmental, Inc.
8519 Jefferson NE
Albuquerque, NM 87113
Tel (505) 821-1801 Fax (505) 821-7371

amec
Earth & Environmental

Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-579-00904 Phase: Task: Machine No: 37046
Project: Zeolite Pond Project Date Tested: 3/20/15
Client: Coyote Drilling Tested By: Jonathan
Contractor: To be used for: Fill / Subgrade Fill
A / E:

Test No.	1	2	3	4	5	6	7	8
Edge. Interior, or Mat?								
Direct or Backscatter (D / B)	D	→	→	D	→	→	→	D
Probe Depth	6	→	→	6	→	→	6	→
Moisture (cpm)								
Density (cpm)								
Air Gap (cpm)								
Ratio								
Wet Density (pcf)	122.4	122.5	120.7	119.8	115.3	119.7	126.9	123.4
Moisture (pcf)	17.9	16.7	16.9	16.9	14.9	15.2	18.8	16.8
Dry Density (pcf)	104.6	105.9	103.8	102.9	100.4	103.9	108.1	106.6
Max Dry Density	109.5	→	105.4	→	→	→	109.5	→
% Compaction	96	97	95	98	95	99	99	97
% Compaction Required	95+	→	→	→	95+	→	→	→
% Moisture	17.1	15.7	16.3	16.4	14.9	15.3	17.4	15.8
% Moisture Required (+/-)	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Proctors			Test No.	Location / Elevation		
Lab #	Density	Moisture	1	West Perimeter Berm Between Grid B+C @ Cell C1	Lot:	Lift:
A-1	105.4	15.8			Elevation: -7' FSG	
A-2	109.5	15.8	2	South Perimeter Berm Grid Line F	Lot:	Lift:
					Elevation: -10' FSG	
			3	East Perimeter Berm Grid Line B	Lot:	Lift:
					Elevation: -13' FSG	
			4	North Perimeter Berm Between Grid line G+I Between Cells A2 and A3	Lot:	Lift:
					Elevation: -10' FSG	
			5	Cell subgrade fill Cell D1 grid D	Lot:	Lift:
					Elevation: -2' FSG	
			6	Cell Subgrade fill Cell D1 grid D	Lot:	Lift:
					Elevation: -2' FSG	
			7	Cell Subgrade fill Cell A2 Grid line G @ Grid A	Lot:	Lift:
					Elevation: -3' FSG	
			8	Cell Subgrade fill Cell C2 Grid G Between Grid B + C	Lot:	Lift:
					Elevation: -3' FSG	

Verbal

Remarks:	Std. Cnt.	Cali.	Field
	Density:		
	Moisture:		

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Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-579-00904 Phase: Task: Machine No: 27046
Project: Zeolite Pond Project Date Tested: 3/30/15
Client: Coyote Drilling Tested By: C Jonathan
Contractor: To be used for: Cell Subgrade Fill
A / E:

Test No.	1	2	3	4	5	6		
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)								
Probe Depth								
Moisture (cpm)								
Density (cpm)								
Air Gap (cpm)								
Ratio								
Wet Density (pcf)	121.9	118.9	123.5	121.3	125.6	123.3		
Moisture (pcf)	15.2	16.3	15.5	15.7	17.1	17.7		
Dry Density (pcf)	106.7	102.6	108	105.6	108.5	105.6		
Max Dry Density	109.5	105.4	109.5	109.5	109.5	109.5		
% Compaction	97	97	99	97	99	96		
% Compaction Required	95	95			95	95		
% Moisture	14.3	15.2	~~14.4~~ 14.4	14.9	15.7	16.8		
% Moisture Required (+/-)	2 2	2 2	2 2	2 2	2 2	2 2		
Meets Specifications (Yes / No)?	Y=>	Y=>	Y=>	Y=>	Y=>	Y=>		

Proctors			Test No.	Location / Elevation		
Lab #	Density	Moisture	1	Cell Subgrade Fill Cell D1	Lot:	Lift:
A-1	105.4	15.8		Grid D	Elevation: -1' FSG	
A-2	109.5	15.8	2	Cell Subgrade Fill Cell B1	Lot:	Lift:
				Grid B	Elevation: -1' FSG	
			3	Cell Subgrade Fill Cell B2	Lot:	Lift:
				Grid B + G	Elevation: -1' FSG	
			4	Cell Subgrade Fill Cell D2	Lot:	Lift:
				Grid G + D	Elevation: -1' FSG	
			5	Cell Subgrade Fill Cell A3	Lot:	Lift:
				Grid I + A	Elevation: -1' FSG	
			6	Cell Subgrade Fill C3	Lot:	Lift:
				Grid I Between B + C	Elevation: -1' FSG	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	

Verbal

Remarks:

Std. Cnt.	Cali.	Field
Density:		
Moisture:		

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Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-579-00904 Phase: Task: Machine No: 27046

Project: Zeolite Pond Project Date Tested: 4/7/15

Client: Coyote Drilling Tested By: Jonathan

Contractor: To be used for: Perimeter Berm Fill

A / E:

Test No.	1	2	3	4				
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)	D	—	—	D				
Probe Depth	6	—	—	6				
Moisture (cpm)								
Density (cpm)								
Air Gap (cpm)	/	/	/	/				
Ratio	/	/	/	/				
Wet Density (pcf)	122.6	123	119.8	120				
Moisture (pcf)	17.8	17.4	14.5	17.1				
Dry Density (pcf)	104.8	105.6	105.3	102.9				
Max Dry Density	109.5	109.5	109.5	105.4				
% Compaction	96	96	96	98				
% Compaction Required	95+	—	—	95+				
% Moisture	17.0	16.5	13.8	16.6				
% Moisture Required (+ / -)	3 2	2 2	2 2	3 2	/	/	/	/
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes				

Proctors			Test No.	Location / Elevation		
Lab #	Density	Moisture				
A-2	109.5	15.8	1	North Perimeter Berm Grid G	Lot:	Lift:
					Elevation: -9' FSG	
A-1	105.4	15.8	2	East Perimeter Berm Between Grid C+B	Lot:	Lift:
					Elevation: -11' FSG	
			3	South Perimeter Berm Grid H	Lot:	Lift:
					Elevation: -9' FSG	
			4	West Perimeter Berm Grid B	Lot:	Lift:
					Elevation: -5' FSG	
Verbal					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	

Remarks:

Std. Cnt.	Cali.	Field
Density:		
Moisture:		

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Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-519-00904 Phase: Task: Machine No: 37046
Project: Coyote Zeolite Pond Project Date Tested: 4/9/15
Client: Coyote Drilling Tested By: Jonathan
Contractor: To be used for: Berm Cut
A / E:

Test No.	9	10	11	12	13	14	15	
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)	D	→	D	→	D	→	→	
Probe Depth	6	→	6	→	6	→	→	
Moisture (cpm)								
Density (cpm)								
Air Gap (cpm)	/	/	/	/	/	/	/	
Ratio	/	/	/	/	/	/	/	
Wet Density (pcf)	122.1	123.7	128.3	125.1	124.3	123.7	125.6	
Moisture (pcf)	17.6	18.5	19.4	18.8	18.1	18.4	17.8	
Dry Density (pcf)	104.4	105.2	108.9	106.3	106.1	105.3	107.8	
Max Dry Density	109.5	→	109.5	→	→	→	109.5	
% Compaction	95	96	100	97	97	96	99	
% Compaction Required	95+	95+	→	→	95+	→	→	
% Moisture	16.9	17.5	17.8	17.7	17.0	17.5	16.5	
% Moisture Required (+/-)	2-5	2-5	2-5	2-5	2-5	2-5	2-5	
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Proctors			Test No.	Location / Elevation		
Lab #	Density	Moisture				
A-2	109.5	15.8	9	Berm Between Cell C3 + Cell B3 Grid Line I	Lot: Lift: Elevation: -12' FSG	
			10	Berm Between Cell A3 + Cell B3 Grid Line I	Lot: Lift: Elevation: -11' FSG	
			11	Berm Between Cell B3 and Cell C3 Grid line I	Lot: Lift: Elevation: -11' FSG	
			12	Berm Between Cell D3 and Cell C3 Grid Line I	Lot: Lift: Elevation: -11' FSG	
			13	Berm Between Cell A3 and Cell B3 Grid Line I	Lot: Lift: Elevation: -10' FSG	
			14	Berm Between Cell B3 and Cell C3 Grid line I	Lot: Lift: Elevation: -10' FSG	
			15	Berm Between Cell C3 and D3 Grid Line I	Lot: Lift: Elevation: -10' FSG	
					Lot: Lift: Elevation:	

Remarks:

Std. Cnt.	Cali.	Field
Density:		2512
Moisture:		767

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Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

1 of 2

Job No: 15-519-00909 Phase: Task: Machine No: 37046

Project: Zeolite Pond Project Date Tested: 4/9/15

Client: Coyote Drilling Tested By: Jonathan M

Contractor: To be used for: Berm fill

A / E:

Test No.	1	2	3	4	5	6	7	8
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)	D	→	→	D	→	→	D	→
Probe Depth	6	→	→	→	6	→	→	6
Moisture (cpm)								
Density (cpm)								
Air Gap (cpm)								
Ratio								
Wet Density (pcf)	124.8	120.6	125.3	121.9	123.8	119.2	127.6	121.2
Moisture (pcf)	18.1	16.1	18.9	16.8	17.5	14.0	19.3	16.9
Dry Density (pcf)	105.9	104.5	106.9	104.6	106.3	104.5	108.3	104.3
Max Dry Density	109.5	→	109.5	→	→	109.5	→	→
% Compaction	97	95	98	96	97	96	99	95
% Compaction Required	95+	→	→	95+	→	→	95+	→
% Moisture	17.0	15.4	17.2	16.1	16.5	14.0	17.8	16.2
% Moisture Required (+/-)	2 2	2 2	2 2	2 2	2 2	2 2	2 2	2 2
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Proctors			Test No.	Location / Elevation		
Lab #	Density	Moisture	1	Berm Between Cell A2 And B3 Grid line I	Lot: Elevation: -13' FSG	Lift:
A-2	109.5	15.8	2	Berm Between Cell D3 and Cell C3 Grid line I	Lot: Elevation: -13' FSG	Lift:
			3	Berm Between Cell B3 and Cell C3 Grid line I	Lot: Elevation: -13' FSG	Lift:
			4	East Perimeter Berm Between Grid B + C	Lot: Elevation: -10' FSG	Lift:
			5	North Perimeter Berm Between Grid F + G	Lot: Elevation: -8' FSG	Lift:
			6	South Perimeter Berm ~~Between~~ Grid Line ~~G~~ F	Lot: Elevation: -8' FSG	Lift:
			7	Berm Between Cell A3 + Cell B3 Grid line I	Lot: Elevation: -12' FSG	Lift:
			8	Berm Between Cell C3 + Cell B3 Grid line I	Lot: Elevation: -12' FSG	Lift:

Remarks:

	Std. Cnt.	Cali.	Field
	Density:		2512
	Moisture:		767

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Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-519-00 904 Phase: Task: Machine No: 30611
Project: Zeolite Pond Project Date Tested: 9-13-15
Client: Coyote Drilling Inc Tested By: Ramiro
Contractor: Rio To be used for: Perimeter Berm Fill
A / E:

Test No.	1	2	3	4	5			
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)	D	D	D	D	D			
Probe Depth	6	6	6	6	6			
Moisture (cpm)	165	160	159	155	158			
Density (cpm)	2406	2591	2319	2628	2520			
Air Gap (cpm)								
Ratio								
Wet Density (pcf)	117.7	115	119.5	115	116			
Moisture (pcf)	14.7	14.3	14.1	13.8	14			
Dry Density (pcf)	103	100.7	105.4	101.2	102			
Max Dry Density	105.4	105.4	105.4	105.4	105.4			
% Compaction	98	96	100	96	97			
% Compaction Required	95	95	95	95	95			
% Moisture	14.3	14.2	13.8	13.6	13.7			
% Moisture Required (+/- 2)								
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes	Yes			

Proctors			Test No.	Location / Elevation		
Lab #	Density	Moisture	1	15' NE from NE corner of Cell A3	Lot:	Lift:
A1	105.4	15.8			Elevation: FS4-1'	
			2	Berm between Cell A3 & B3 between GL H & I	Lot:	Lift:
					Elevation:	
			3	Berm between Cell B3 & C3 betwee GL H & I	Lot:	Lift:
					Elevation:	
			4	Berm between cell C3 & D3 between GL H & I	Lot:	Lift:
					Elevation:	
			5	15' SE from SE corner of cell D3	Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	
					Lot:	Lift:
					Elevation:	

Remarks:

Std. Cnt.	Cali.	Field
Density:		2108
Moisture:		641

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Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-519-00904 Phase: Task: Machine No: 30611
Project: Zeolite Pond Project Date Tested: 4-15-15
Client: Coyote Drilling Inc Tested By: Ramiro
Contractor: Same To be used for: Berm Fill
A / E:

Test No.	1	2	3	4				
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)	D	D	D	D				
Probe Depth	6	6	6	6				
Moisture (cpm)	199	165	159	180				
Density (cpm)	2079	2224	2350	2280				
Air Gap (cpm)								
Ratio								
Wet Density (pcf)	124.5	120	119.5	121				
Moisture (pcf)	18.2	14.8	14.3	16.3				
Dry Density (pcf)	106.3	105.2	105.2	104.7				
Max Dry Density	105.4	105.4	105.4	105.4				
% Compaction	100+	100	100	99				
% Compaction Required	95	95	95	95				
% Moisture	17.1	14.1	13.6	15.5				
% Moisture Required (+/-)2								
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes				

Proctors			Test No.	Location / Elevation	
Proctor #	Density	Moisture			
A1	105.4	15.8	1	At Grid line A & H	Lot: Lift: Elevation: FSh - 6'
			2	At Grid Line C & F	Lot: Lift: Elevation: FSh - 6'
			3	10' SE from SE corner of Cell A1	Lot: Lift: Elevation: FSh - 5'
			4	At Grid Line C & H	Lot: Lift: Elevation: FSh - 5'
					Lot: Lift: Elevation:
					Lot: Lift: Elevation:
					Lot: Lift: Elevation:
					Lot: Lift: Elevation:

Remarks:

	Std. Cnt.	Call.	Field
Density:			2104
Moisture:			637

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Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-519-co 904 Phase: Task: Machine No: 30611

Project: Zeolite Pond Project Date Tested: 4-15-15

Client: Coyote Drilling Inc Tested By: Ramiro

Contractor: Same To be used for: Perimiter Berm Fill

A / E:

Test No.	1	2	3	4	5	6	7	8
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)	D	D	D	D	D	D	D	D
Probe Depth	6	6	6	6	6	6	6	6
Moisture (cpm)	170	185	157	156	170	160	162	170
Density (cpm)	2495	2381	2393	2468	2360	2585	2276	2308
Air Gap (cpm)								
Ratio								
Wet Density (pcf)	115.7	118	117.4	116.3	118.5	115	120.4	119.7
Moisture (pcf)	15.3	16.5	14	13.9	15.3	14.3	14.5	15.3
Dry Density (pcf)	100.4	101.2	103.9	102.4	103.2	100.7	105.9	104.4
Max Dry Density	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4
% Compaction	95	96	99	97	98	96	100	99
% Compaction Required	95	95	95	95	95	95	95	95
% Moisture	15.2	16.6	13.5	13.6	14.8	14.2	13.7	14.7
% Moisture Required (+/-) 2								
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Proctors: Cell	Density	Moisture	Test No.	Location / Elevation	
A1	105.4	15.8	1	10' NW from NW corner of cell A1	Lot: Lift: Elevation: FS4-6'
			2	15' NE from NE corner of cell A3	Lot: Lift: Elevation: FS4-6'
			3	10' SE from SE corner of cell D3	Lot: Lift: Elevation: FS4-6'
			4	15' SW from SW corner of cell D1	Lot: Lift: Elevation: FS4-6'
			5	At Grid Line B & E	Lot: Lift: Elevation: FS4-5'
			6	15' NW from NW corner of cell A3	Lot: Lift: Elevation: FS4-5'
			7	10' SE from SE corner of cell C3	Lot: Lift: Elevation: FS4-5'
			8	15' SW from SW corner of cell D2	Lot: Lift: Elevation: FS4-5'

Remarks:

Std. Cnt	Cali	Field
Density:		2104
Moisture:		637

Date of Preparation: September 15, 1992
Revision #2 Last revised: April 7, 2003

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Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-519-co 904 Phase: Task: Machine No: 30611
Project: Zeolite Pond Project Date Tested: 4-15-15
Client: Coyote Drilling Inc Tested By: Ramiro
Contractor: Same To be used for: Perimiter Berm Fill
Site:

Test No.	1	2	3	4	5	6	7	8
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)	D	D	D	D	D	D	D	D
Probe Depth	6	6	6	6	6	6	6	6
Moisture (cpm)	170	185	157	156	170	160	162	170
Density (cpm)	2495	2381	2393	2468	2360	2585	2276	2308
Air Gap (cpm)								
Ratio								
Wet Density (pcf)	115.7	113	117.4	116.3	118.5	115	120.4	119.7
Moisture (pcf)	15.3	16.5	14	13.9	15.3	14.3	14.5	15.3
Dry Density (pcf)	100.4	101.2	103.4	102.4	103.2	100.7	105.9	104.4
Max Dry Density	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4
% Compaction	95	96	99	97	98	96	100	99
% Compaction Required	95	95	95	95	95	95	95	95
Moisture	15.2	16.6	13.5	13.6	14.8	14.2	13.7	14.7
% Moisture Required (+ / - 2)								
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Lift	Proctor Density	Proctor Moisture	Test No.	Location / Elevation		
1	105.4	15.8	1	10' NW from NW corner of cell A1	Lot:	Lift:
					Elevation: FS 4-6'	
			2	15' NE from NE corner of cell A3	Lot:	Lift:
					Elevation: FS 4-6'	
			3	10' SE from SE corner of cell D3	Lot:	Lift:
					Elevation: FS 4-6'	
			4	15' SW from SW corner of cell D1	Lot:	Lift:
					Elevation: FS 4-6'	
			5	At Grid Line B & E	Lot:	Lift:
					Elevation: FS 4-5'	
			6	15' NW from NW corner of cell A3	Lot:	Lift:
					Elevation: FS 4-5'	
			7	10' SE from SE corner of cell C3	Lot:	Lift:
					Elevation: FS 4-5'	
			8	15' SW from SW corner of cell D2	Lot:	Lift:
					Elevation: FS 4-5'	

Remarks:

	Std. Cnt.	Cal.	Field
Density:			2104
Moisture:			637

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Field Density Test (Nuclear Method) ASTM (D2922, D3017, & D2950)

Job No: 15-519-00904 Phase: Task: Machine No: 30611
Project: Zeolite Pond Project Date Tested: 4-15-15
Client: Coyote Drilling Inc Tested By: Ramiro
Contractor: Same To be used for: Berm Fill
A / E:

Test No.	1	2	3	4				
Edge, Interior, or Mat?								
Direct or Backscatter (D / B)	D	D	D	D				
Probe Depth	6	6	6	6				
Moisture (cpm)	199	165	159	180				
Density (cpm)	2079	2224	2350	2280				
Air Gap (cpm)								
Ratio								
Wet Density (pcf)	124.5	120	119.5	121				
Moisture (pcf)	18.2	14.8	14.3	16.3				
Dry Density (pcf)	106.3	105.2	105.2	104.7				
Max Dry Density	105.4	105.4	105.4	105.4				
% Compaction	100+	100	100	99				
% Compaction Required	95	95	95	95				
% Moisture	17.1	14.1	13.6	15.5				
% Moisture Required (+/- 2)								
Meets Specifications (Yes / No)?	Yes	Yes	Yes	Yes				

Proctors Lab #	Density	Moisture	Test No	Location / Elevation	
11	105.4	15.8	1	At Grid line A & H	Lot: Lift: Elevation: FSG - 6'
			2	At Grid Line C & F	Lot: Lift: Elevation: FSG - 6'
			3	10' SE from SF corner of Cell A1	Lot: Lift: Elevation: FSG - 5'
			4	At Grid Line C & H	Lot: Lift: Elevation: FSG - 5'
					Lot: Lift: Elevation:
					Lot: Lift: Elevation:
					Lot: Lift: Elevation:
					Lot: Lift: Elevation:

Remarks:

Std. Cnt.	Call.	Field
Density:		2104
Moisture:		637

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Sierra Geosynthetic Services, Inc.
Project Completion Report

Sold To: HOMESTAKE RECLAMATION PROJECT

Project Name: HOMESTAKE ZEOLITE PONDS

Project Number: S150010

Date Complete: 6-1-2015

FINAL QUANTITIES

ITEM	DESCRIPTION	QUANTITY	NOTES
	60 MIL SMOOTH	105,694	
	BOOTS 8"	53	
	BOOT 18"	1	

SGS MATERIALS LEFT ON SITE

DESCRIPTION	QUANTITY	NOTES
2 ROLLS 60 MIL SMOOTH		540' x 23' EACH

LIST ALL ROLL NUMBERS ON THE MATERIAL REPORT AND ATTACH TO THIS REPORT

DID YOU HAVE FIELD CHANGE ORDERS STANDBY HOW MANY: 5 DAYS

THIS JOB IS 100% DONE ☑ IF NOT, EXPECTED RETURN DATE: _____

Notes: _____

The project has been left in a clean, orderly fashion acceptable to the customer. _____ (INITIALS) _____ (DATE)

THE WORK IS COMPLETE, SATISFACTORY, QUANTITIES AGREED TO AND ACCEPTED BY:

[signature]
SGS SUPERINTENDENT SIGNATURE

6-1-2015
DATE

Dan Kump
AUTHORIZED SIGNATURE

SR. PROJ. ENGR
TITLE

HOMESTAKE
COMPANY

6-1-15
DATE

SHIPPING ADDRESS:
TRI/Environmental, Inc.
A Texas Research International Company
9063 Bee Caves Road, Austin, Texas 78733-6201

GEOSYNTHETIC TESTING LABORATORIES
1-800-880-8378
FAX: 512 263 2558

CHAIN OF CUSTODY/TEST REQUEST FORM - DESTRUCTIVE SEAMS

Page ____ of ____

REPORT RESULTS TO:		
	Client Contact:	Client Phone/Fax:
	Client Company:	Client Field Phone:/Fax:
	Project Name:	Project Number:
	Client Mailing Address:	E-mail:
	Client City, State, Zip:	Shipped by: Date:

SEND INVOICE TO:		
	COMPLETE ONLY IF DIFFERENT FROM ABOVE	Phone:
	Client Contact:	Fax:
	Client Company:	**Client P.O. #:**
	Client Mailing Address:	**E-mail:**
	Client City, State, Zip:	Shipped by: Date:

	Geomembrane Seams Sample Identification	**Top Panel No.**	**Bottom Panel No.**	**Machine Number**	**Thickness/ Resin Type (ex: 60 HDPE)**	**Weld Type**	**Welder (personnel)**	**Date / Time Sampled**
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Remarks:

Standard Test Methods: ASTM D 6392 , D 4437 , D6214, other _____) Please circle requested test procedure

PLEASE CONTACT TRI WITH QUESTIONS REGARDING APPROPRIATE TEST PROCEDURES

"As-Received" Notes:

TRI Log. Number:
Due Date:

PLEASE AUTHORIZE BY SIGNING AND DATING BELOW.

NAME: _____ **SIGNATURE/DATE:** _____

Precision Geosynthetic Laboratories

Corporate Office & Main Laboratory : 1160 North Gilbert Street, Anaheim, CA, 92801, Tel.: (800) 522-4599

SEND YOUR SEAMS TO:

PGL MAIN LABORATORY

ATTN: CHRISTIAN SEBASTIAN
1160 North Gilbert Street
Anaheim, California, 92801
Tel. No.: (800) 522-4599

DATE : _____

PROJECT NAME / PROJECT NUMBER: _____

PROJECT LOCATION: _____ ☐ New ☐ Repair

Seam ID					Type of Welding Process			Type of Material		
Item	DS Number	Panel No.	Location	Name of Operator	FUSION	EXTRUSION	Solvent Weld	HDPE	LLDPE	rPP/PVC/PP
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

TEST METHOD
(Check which is applicable)

- ☐ SHEAR- ASTM D4437
  PEEL - ASTM D4437
- ☐ SHEAR - ASTM D751
  PEEL - ASTM D413
  Crosshead Speed = 2"/min
- ☐ SHEAR- ASTM D4437
  (NSF Modified)
  Crosshead Speed= 20"/min
  PEEL - ASTM D4437 NSF Modified
  Crosshead Speed= 20"/min
- ☐ SHEAR - ASTM D3083
  Crosshead Speed= 20"/min
  PEEL - ASTM D413 Crosshead Speed= 2"/min
- ☐ HDPE
  SHEAR- ASTM D6392
  PEEL-ASTM D6392
- ☐ LLDPE / PVC
  SHEAR - ASTM D6392
  PEEL - ASTM D6392
- ☐ SHEAR- ASTM D4437
  (NSF Modified)
  Crosshead Speed = 2"/min
  PEEL - ASTM D4437
  (NSF Modified)
  Crosshead Speed = 2"/min

REPORT TO

NAME :
COMPANY :
ADDRESS: :

TEL NO: : _____
FAX NO: :
E-MAIL: :

RELEASED BY

NAME :
COMPANY :
DATE/TIME :

RECEIVED BY

Precision Geosynthetic Labs
NAME :
DATE/TIME :

FIELD CONTACT

NAME :
TEL NO: : _____
Mobile No. : _____
FAX NO: :
E-MAIL: : _____

SHIPPED VIA

O Fedex O DHL
O UPS O US Mail
O Hand Carry O Others
Tracking Number: _____

NOTES:
PGL Laboratories are normally OPEN on SATURDAYS for SEAM TESTING.
To ensure that your package is delivered/received on Saturdays; please fax, e-mail or call to let us know the AIRBILL # of your package. This will help us track down samples for SATURDAY DELIVERY.

PLEASE WRITE YOUR INSTRUCTIONS BELOW

Thickness required? O **Yes** O **NO**

IF SOLVENT WELD:
Curing Time:_____? Curing Temp:_____?

Page ___ of ___

Sent

Sierra Geosynthetic Services, Inc.
Field Change Order

Project Name: HOMESTAKE ZEOLITE PONDS **Date:** 5-8-95
Project Manager: TRACY LARSON **C/O Number:** 1
Superintendent: **Job Number:** 5150010

☐ Extra Work ☐ Change in Specifications ☐ Change in Design ☒ Other

Explain: STANDBY DAY 1 SURT 2 TECHS, WAITING FOR COYOTE TO COMPLETE ENOUGH OF CELLS FOR US + THEM TO WORK SAFELY

Authorization to Proceed: _____ _____

Title — Owner / Representative / Contractor

Authorization Must be Signed Prior to Performing Work

ID	Item	Unit	Quantity	ID	Item	Unit	Quantity
	Labor				**Equipment**		
1	Superintendent	Man Hrs		13	Misc. Tools & Equipment	Day	
2	Leadman	Man Hrs		14	Extrusion Welder	Day	
3	Technician	Man Hrs		15	Wedge Welder	Day	
4	Travel / Driving Hours	Man Hrs		16	Generator / Portable	Day	
5	Subsistence / Perdiem	Man Day		17	Generator 15 kw	Day	
	Standby			18	Pick-Up / Van	Day	
6	On - Site (Actual)	Man Hrs		19	Vehicle Milage (Combined Total)	Day	
7	At Motel 8	Man Hrs		20	ATV / Tractor	Day	
	Mobilization			21	Forklift	Day	
8	Equipment Mob	Ea		22	Loader	Day	
9	Equipment Demob	Ea		23			
	Schedule				**Materials**		
10	Extension of Schedule	Days	2	24			
	Misc.			25			
11				26			
12				27			

The area of the extra work has been left clean, orderly fashion acceptable to the customer. Initials: _____

Date: _____

Authorized Signature *Authorized Signature*

SGS Superintendent Owner / Representative / Contractor

SGM

Sierra Geosynthetic Services, Inc.
Field Change Order

Project Name: HOMESTAKE ZEOLITE PONDS **Date:** 5-9-15
Project Manager: TRACY LARSON **C/O Number:** 2
Superintendent: Robert VOGT **Job Number:** 515001B

☐ Extra Work ☐ Change in Specifications ☐ Change in Design ☒ Other

Explain: STANDBY DAY 1 SUPT 2 TRCKS, THE STANDBY DAYS ARE ON GOING, UNTIL DETERMIND SAFE FOR US & COYOTE TO WORK SAFELY

Authorization to Proceed: _____ _____

Title — Owner / Representative / Contractor

Authorization Must be Signed Prior to Performing Work

ID	Item	Unit	Quantity	ID	Item	Unit	Quantity
	Labor				**Equipment**		
1	Superintendent 1	Man Hrs		13	Misc. Tools & Equipment	Day	
2	Leadman	Man Hrs		14	Extrusion Welder	Day	
3	Technician	Man Hrs		15	Wedge Welder	Day	
4	Travel / Driving Hours	Man Hrs		16	Generator / Portable	Day	
5	Subsistence / Perdiem	Man Day		17	Generator 15 kw	Day	
	Standby			18	Pick-Up / Van	Day	
6	On - Site (Actual)	Man Hrs		19	Vehicle Milage (Combined Total)	Day	
7	At Motel 8	Man Hrs		20	ATV / Tractor	Day	
	Mobilization			21	Forklift	Day	
8	Equipment Mob	Ea		22	Loader	Day	
9	Equipment Demob	Ea		23			
	Schedule				**Materials**		
10	Extension of Schedule	Days		24			
	Misc.			25			
11				26			
12				27			

The area of the extra work has been left clean, orderly fashion acceptable to the customer. Initials: _____

Date: _____

Authorized Signature *Authorized Signature*

SGS Superintendent Owner / Representative / Contractor

Sierra Geosynthetic Services, Inc.
Field Change Order

Project Name: HOMESTAKE ZEOLITE PONDS **Date:** 5-11-15
Project Manager: TRACY LARSON **C/O Number:** 3
Superintendent: Robert VOGT **Job Number:** S150010

☐ Extra Work ☐ Change in Specifications ☐ Change in Design ☒ Other

Explain: STANDBY DAY 1 SUPT, 7 TECHS, WAITING FOR COMPLETION OF FIRST 4 CELLS TO SAFETY.

Authorization to Proceed:

Title — Owner / Representative / Contractor

Authorization Must be Signed Prior to Performing Work

ID	Item	Unit	Quantity	ID	Item	Unit	Quantity
	Labor				**Equipment**		
1	Superintendent 1	Man Hrs	DAY	13	Misc. Tools & Equipment	Day	
2	Leadman	Man Hrs		14	Extrusion Welder	Day	
3	Technician 7	Man Hrs	DAY	15	Wedge Welder	Day	
4	Travel / Driving Hours	Man Hrs		16	Generator / Portable	Day	
5	Subsistence / Perdiem	Man Day		17	Generator 15 kw	Day	
	Standby			18	Pick-Up / Van	Day	
6	On - Site (Actual)	Man Hrs		19	Vehicle Milage (Combined Total)	Day	
7	At Motel 8 5 ROOMS	Man Hrs	DAY	20	ATV / Tractor	Day	
	Mobilization			21	Forklift	Day	
8	Equipment Mob	Ea		22	Loader	Day	
9	Equipment Demob	Ea		23			
	Schedule				**Materials**		
10	Extension of Schedule	Days		24			
	Misc.			25			
11				26			
12				27			

The area of the extra work has been left clean, orderly fashion acceptable to the customer. Initials: _____

Date: _____

Authorized Signature *Authorized Signature*

SGS Superintendent Owner / Representative / Contractor

Sierra Geosynthetic Services, Inc.
Field Change Order

Project Name: HOMESTAKE ZEOLITE PONDS
Date: 5-12-15
Project Manager: TRACY LARSON
C/O Number: 4
Superintendent: ROBERT VOOT
Job Number: 515001B

☐ Extra Work ☐ Change in Specifications ☐ Change in Design ☒ Other

Explain: STANDBY DAY 1 SUPT. 2 TECHS AT MOTEL WAITING FOR COMPLETION OF FIRST 4 CELLS, SO FOURY BODY CAN WORK SAFELY

Authorization to Proceed:

Title — Owner / Representative / Contractor

Authorization Must be Signed Prior to Performing Work

ID	Item	Unit	Quantity	ID	Item	Unit	Quantity
	Labor				**Equipment**		
1	Superintendent 1	Man Hrs	DAY	13	Misc. Tools & Equipment	Day	
2	Leadman	Man Hrs		14	Extrusion Welder	Day	
3	Technician 2	Man Hrs	DAY	15	Wedge Welder	Day	
4	Travel / Driving Hours	Man Hrs		16	Generator / Portable	Day	
5	Subsistence / Perdiem	Man Day		17	Generator 15 kw	Day	
	Standby			18	Pick-Up / Van	Day	
6	On - Site (Actual)	Man Hrs		19	Vehicle Milage (Combined Total)	Day	
7	At Motel 8 / 5 ROOMS	Man Hrs		20	ATV / Tractor	Day	
	Mobilization			21	Forklift	Day	
8	Equipment Mob	Ea		22	Loader	Day	
9	Equipment Demob	Ea		23			
	Schedule				**Materials**		
10	Extension of Schedule	Days		24			
	Misc.			25			
11	4 DAYS	4		26			
12				27			

The area of the extra work has been left clean, orderly fashion acceptable to the customer. Initials: _____

Date: _____

Authorized Signature — *Authorized Signature*

SGS Superintendent — Owner / Representative / Contractor

5

Sierra Geosynthetic Services, Inc.
Field Change Order

Project Name: HOMESTAKE ZEOLITE POND 1 **Date:** 3-13-15
Project Manager: TRACY LARSON **C/O Number:** 5
Superintendent: ROBERT VOGT **Job Number:** 5150010

☐ Extra Work ☐ Change in Specifications ☐ Change in Design ☒ Other

Explain: STANDBY DAY (COYOTE) IS ALMOST THERE MAYBE THIS WILL BE LAST DAY.

Authorization to Proceed:

Title — Owner / Representative / Contractor

Authorization Must be Signed Prior to Performing Work

ID	Item	Unit	Quantity	ID	Item	Unit	Quantity
	Labor				**Equipment**		
1	Superintendent /	Man Hrs	DAY	13	Misc. Tools & Equipment	Day	
2	Leadman	Man Hrs		14	Extrusion Welder	Day	
3	Technician 7	Man Hrs	056	15	Wedge Welder	Day	
4	Travel / Driving Hours	Man Hrs		16	Generator / Portable	Day	
5	Subsistence / Perdiem	Man Day		17	Generator 15 kw	Day	
	Standby			18	Pick-Up / Van	Day	
6	On - Site (Actual)	Man Hrs		19	Vehicle Milage (Combined Total)	Day	
7	At Motel 8 / 5 room	Man Hrs	DAY	20	ATV / Tractor	Day	
	Mobilization			21	Forklift	Day	
8	Equipment Mob	Ea		22	Loader	Day	
9	Equipment Demob	Ea		23			
	Schedule				**Materials**		
10	Extension of Schedule	Days		24			
	Misc.			25			
11	5			26			
12				27			

The area of the extra work has been left clean, orderly fashion acceptable to the customer. Initials: _____

Date: _____

Authorized Signature *Authorized Signature*

SGS Superintendent Owner / Representative / Contractor

SGS, INC.

Pre-Weld / [illegible]tive Sample Information

Project Name: Homestake Zeolite Ponds

Job#: S 150010

Project Manager: Tracy Larsen

Primary Secondary Other: _____

Superintendent: Bob Vogt

Material: 60 mil HDPE Smooth

Reported By: Kenneth Trautman

[X] Preweld Test [ ] Destructive Test

Peel Test(Extr.) min 78 ppi Peel Test(Fusion) 98 ppi Shear Test min 121 ppi

D.S. No.	Seam No.	Weld Time	Weld Date	Operator Name/ ID	Machine Number	Coupon 1 A / B	Coupon 2 A / B	Coupon 3 A / B	Coupon 4 A / B	Coupon 5 A / B	Coupon 1 Shear	Coupon 2 Shear	Results	Notes
		7:15	5/14/15	JAM	M#21	133/122	121/126	132/127	/	/	174	184	(P) F	750/7
		6:40	5/15/15	JAM	M#21	136/131	131/121	135/133	/	/	177	174	(P) F	750/7
		10:17	5/15/15	ARR	MX09	1215	1216	1218	/	/	158	149	(P) F	520/520
		6:50	5/18/15	JAM	M#21	153/141	142/135	137/131	/	/	198	181	(P) F	750/7
		2:00	5/19/15	ARR	MX09	130	1219	1227	/	/	189	197	(P) F	520/520
		8:30	5/19/15	JAM	M#2	133/139	127/129	131/130	/	/	180	177	(P) F	750/7
		1:03	5/19/15	JAM	M#21	131/147	141/140	129/133	/	/	193	174	P F	750/7
		1:39	5/19/15	ARR	MX09	131	132	129	/	/	169	157	(P) F	520/520
		3:10	5/19/15	JAM	MX 0	1311	127	133	/	/	171	162	(P) F	485/500
		6:50	5/20/15	JAM	MX	1311	1221	1201	/	/	174	169	(P) F	525/500
		6:53AM	5/20/15	ARR	MX0	129	13B	127	/	/	167	171	(P) F	525/5
		1:00	5/20/15	JAM	MX	1311	130	1291	/	/	171	166	(P) F	525/500
		1:03pm	5/20/15	ARR	MX	129	132	1215	/	/	165	169	(P) F	525/525
		6:30AM	5/21/15	ARR	M 9	131	129	130	/	/	180	176	(P) F	530/530
		6:45	5/21/15	JM	MX	127	33	1251	/	/	177	171	(P) F	545/500
		8:25AM	5/22/15	RR		122	129	131	/	/	169	167	(P) F	530/530
		8:30	5/22/15	JM	M	1211	1311	1231	/	/		170	(P) F	

Samples Sent Via: _____ Last Sample #: _____ On (Date): _____

Notes: _____

S, INC.

Pre-Weld / tive Sample Information

Project Name: Homestead Zeolite Ponds

Job#:

Project Manager: Tracy Larson

Primary Secondary Other:

Superintendent: Bob Vogt

Material:

Reported By: Kenneth Trautman

[X] Preweld Test [ ] Destructive Test

D.S. No.	Seam No.	Weld Time	Weld Date	Operator Name/ ID	Machine Number	Peel Test(Extr.) min Coupon 1 A / B	Coupon 2 A / B	ppl Coupon 3 A / B	Peel Test(Fusion) Coupon 4 A / B	Coupon 5 A / B	ppl Coupon 1 Shear	Shear Test mlm Coupon 2 Shear	ppl Results	Notes
		6:40	5/23/15	JAM	M#21	131/129	142/137	133/133	1	1	174	165	P F	750/7
		10:00AM	5/23/15	ARR	MX09	134	129	131	1	1	163	167	P F	530/530
		12:55	5/23/15	JAM	M#21	127/128	121/127	132/129	1	1	167	166	P F	750/7
		6:30 AM	5/26/15	JAM	M#2	129/136	131/132	71	1	1	173	177	P F	750/7
		11:00AM	5/26/15	ARR	MX09	1217	1218	1251	1	1	161	160	P F	520/520
		1:25	5/26/15	JAM	M#21	129/137	133/130	147/131	1	1	173	173	P F	750/7
		6:46	5/27/15	JAM	M#	124/127	127/126	125/133	1	1	177	169	P F	750/7
		12:50	5/27/15	JAM	M#2	123/130	131/126	122/129	1	1	167	168	P F	750/7
		3:28	5/27/15	ARR	MX09	129	1310	133	1	1	160	165	P F	530/530
		6:30	5/28/15	JAM	M#21	128/130	133/127	129/132	1	1	191	178	P F	750/7
		9:44	5/28/15	ARR	MX09	1216	130	132	1	1	162	169	P F	520/520
		10:00	5/28/15	JAM	MX 0	1	1291	1	1	1	167	171	P F	500/500
		2:50	5/28/15	JAM	MX-10	133	126	130	1	1	167	169	P F	500/500
		2:55	5/29/15	ARR	M 09	138	130	132	1	1	169	166	P F	520/520
		6:30	5/29/15	ARR		1371	1219	1311	1	1	171	171	P F	530/530
		6:50	5/29/15	JAM		1261	1291	1	1	1	169	177	P F	500/500
		1:00	5/29/15	JAM	M# 0	1311	1211	1271	1	1	167	160	P F	500/500

Samples Sent Via: Last Sample #: On (Date):

Notes:

GS, INC.

Pre-Weld / P tive Sample Information

Project Name: Homestake Zeolite Ponds

Job#: S150010

Project Manager: Tracy Larson

Primary Secondary Other:

Superintendent: Bob Vogt

Material: 60mil Smooth HDPE

Reported By: Kenneth Troutman

[ ] Preweld Test (✓) ~~Destructive Test~~

Peel Test(Extr.) min 78 ppi Peel Test(Fusion) 98 ppi Shear Test mim 121 ppi

D.S. No.	Seam No.	Weld Time	Weld Date	Operator Name/ ID	Machine Number	Coupon 1 A / B	Coupon 2 A / B	Coupon 3 A / B	Coupon 4 A / B	Coupon 5 A / B	Coupon 1 Shear	Coupon 2 Shear	Results	Notes
1	11/13	9:43	5-15-15	JAM	#021	161/126	143/137	139/146	125/124	144/134	—	—	(P) F	Peel 750/7
						180/	177/	176/	167/	178/	—	—	(P) F	Shear
2	20/21	9:07	5-18-15	JAM	#021	114/115	112/124	126/118	118/124	128/115	—	—	(P) F	Peel
						171/	170/	165/	161/	160/	—	—	(P) F	Shear
3	26/27	11:00	5-18-15	JAM	#021	130/130	129/119	117/132	120/119	121/140	—	—	(P) F	Peel
						153/	149/	145/	150/	162/	—	—	(P) F	Shear
4	41/43	7:00	5-23-15	JAM	#021	120/126	129/121	119/127	118/121	117/125	—	—	(P) F	Peel 750/7
						156/	152/	145/	157/	145/	—	—	(P) F	Shear
5	63/15	1:16	5-23-15	JAM	#021	115/117	118/113	116/124	116/118	128/125	—	—	(P) F	Peel 750/7
						143/	145/	136/	144/	149/			(P) F	Shear
6	78/80	11:11a	5-26-15	JAM	#021	120/146	117/136	120/123	128/119	121/126			(P) F	Peel 750/7
						164/	165/	162/	154/	170/			(P) F	Shear
7	70/23	3:06	5-26-15	JAM	#021	117/112	119/110	115/110	120/113	122/126			(P) F	Peel 750/7
						135/	130/	140/	131/	128/			(P) F	Shear
8	93/92	9:09	5-27-15	JAM	#021	115/110	117/118	120/113	124/112	120/118			(P) F	Peel
						154/	153/	139/	139/	151/			(P) F	Shear
9	102/99	8:55	5-27-15	JAM	#01	121/112	116/118	115/127	121/123	124/111			(P) F	Peel
						155	60	159	160				(P)	Shear

Samples Sent Via: Last Sample #: On (Date):

Notes:

SGS, INC.

Pre-Weld / Destructive Sample Information

Project Name: HOMESTAKE ZEOLITE PONDS

Job#: 5150010

Project Manager: TRACY LARSON

(Primary) Secondary Other: _____

Superintendent: Robert VOLY

Material: 60 m. sm

Reported By: " "

[ ] Preweld Test (X) Destructive Test

Peel Test(Extr.) min ppi Peel Test(Fusion) 98 ppi Shear Test min 120 ppi

D.S. No.	Seam No.	Weld Time	Weld Date	Operator Name/ ID	Machine Number	Coupon 1 A/B	Coupon 2 A/B	Coupon 3 A/B	Coupon 4 A/B	Coupon 5 A/B	Coupon 1 Shear	Coupon 2 Shear	Results	Notes
DS 10	P 106/104	1:44 AM	5-27-15	JAM	021	106/108	111/108	107/106	115/107	110/106			(P) F	750/7
						162/	158/	163/	158/	157/			(P) F	
DS 11	P 74/111	2:30 PM	5-27-15	JAM	021	113/121	109/112	122/127	117/110	116/117			(P) F	750/7
						133/	137/	141/	134/	146/			(P) F	
DS 12	P 123/124	7:44 PM	5-28-15	JAM	021	122/118	103/110	112/119	123/110	115/121			(P) F	750/7
						149/	159/	148/	144/	153/			(P) F	
DS 13	P 88/120	9:18 AM	5-28-15	JAM	021	113/120	120/121	119/123	116/115	115/117			(P) F	750/7
						143/	139/	144/	138/	142/			(P) F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	

Samples Sent Via: _____ Last Sample #: _____ On (Date): _____

Notes: _____

DAILY PANEL PLACEMENT

Deployment Date 5-14-15

Daily Panel Placement

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: BOB Vogt

Material: 60 mill - Smooth Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel # 1	Roll # F15B166092	Panel # 2	Roll # 6092	Panel # 3	Roll # 6092
22.5 / 87		22.5 / 87		22.5 / 35	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 1957.5		Final SF 1957.5		Final SF 787.5	

Panel # 4	Roll # 6092	Panel # 5	Roll # 6092	Panel # 6	Roll # 6092
22.5 / 35		5-14-15 end; 22.5; wedge; 1.7 ac; 35; 5-14-15		Start 5-15-15; 27.5; 35	
Initial SF	Lineal Feet Trench	Initial SF 5,920 sq ft	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 787.5		Final SF 394		Final SF 394	

Panel # 7	Roll # 6092	Panel # 8	Roll # 6092
22.5 / 31		22.5; wedge; 29	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 697.5		Final SF 326.25	

Total Initial SF This Page ____ SF

Total Final SF This Page 7,338 SF

Anchor Trench

Total Linear feet trench ____ LF

X

Depth and width allowed in trench ____ LF

= Total SF in Trench ____ SF

Total Pay Area This Page 7,338 SF

Total Previous Pages 0 SF

Total Pay Area to Date 7,338 SF

SGS. Inc
Daily Panel Placement

Page _____ of _____

Deployment Date 5-15-15

Project Name: Homestake Zeolite Ponds Job # 5150010 Supt: BoD vogt

Material: 60 mill smooth Primary [ ] Secondary [ ] Pond # _____ Cell # _____ Pad # _____ Other: _____

Panel # 9	Roll # 6092	Panel # 10	Roll # 6092	Panel # 11	Roll # 6092
22.5	wedge 31	22.5 End Pond #1 8,362	31	Start Pond 2 22.5	88
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 326.25		Final SF 697.5		Final SF 1980	

Panel # 12	Roll # 6092	Panel # 13	Roll # F15B166091	Panel # 14	Roll # 6091
22.5	31	22.5	57	2	31
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 697.5		Final SF 1282.5		Final SF 697.5	

Panel # 15	Roll # 6091	Panel # 16	Roll # 6091
22.5	36	22.5 End 5-15-15	36
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 810		Final SF 810	

Total Initial SF This Page	SF
Total Final SF This Page 7,301.5	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page 7,301.5	SF
Total Previous Pages 7338	SF
Total Pay Area to Date 14,639.5	SF

8,719.5 sqft
5-15-15

Daily Panel Placement

Deployment Date 5-17-15

Project Name: Homestake Zeolite Ponds Job #S1500.10 Supt: Bob Vogt

Material: 60 mil Smooth Primary [ ] Secondary [ ] Pond # X Cell # Pad # Other:

Panel # 17	Roll # 6092	Panel # 18	Roll # 6092	Panel # 19	Roll # 6092
5-18-15					
22.5		22.5		22.5	
35		35		35	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 787.5		Final SF 787.5		Final SF 787.5	

Panel # 20	Roll # 6091	Panel # 21	Roll # 6091	Panel # 22	Roll # 6091
22.5		22.5		22.5	
86		86		31	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 1935		Final SF 1935		Final SF 697.5	

Panel # 23	Roll # 6091	Panel # 24	Roll # 6091	
22.5		22.5		
33		31		
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	
Final SF 742.5		Final SF 697.5		

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page 8370	SF
Total Previous Pages 14,639.5	SF
Total Pay Area to Date 23,009.5	SF

Daily Panel Placement

Deployment Date 5-17-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Vogt

Material: 60 mil Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel # 25	Roll # 6091	Panel # 26	Roll # 6087	Panel # 27	Roll # 6087
22.5 / 15		22.5 / 86		22.5 / 86	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 337.5		Final SF 1935		Final SF 1935	

Panel # 28	Roll # 6087	Panel # 29	Roll # 6087	Panel # 30	Roll # 6087
22.5 / 28		22.5 / 31		22.5 / 31	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 630		Final SF 697.5		Final SF 697.5	

Panel # 31	Roll # 6087	Panel # 32	Roll # 6087
22.5 / 15		22.5 / 10	end 5-17-15
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 337.5		Final SF 225	

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	6795 SF
Total Previous Pages	23,009.5 SF
Total Pay Area to Date	29,804.5 SF

15,389.5 Sqft
5-17-15

SGS. Inc
Daily Panel Placement

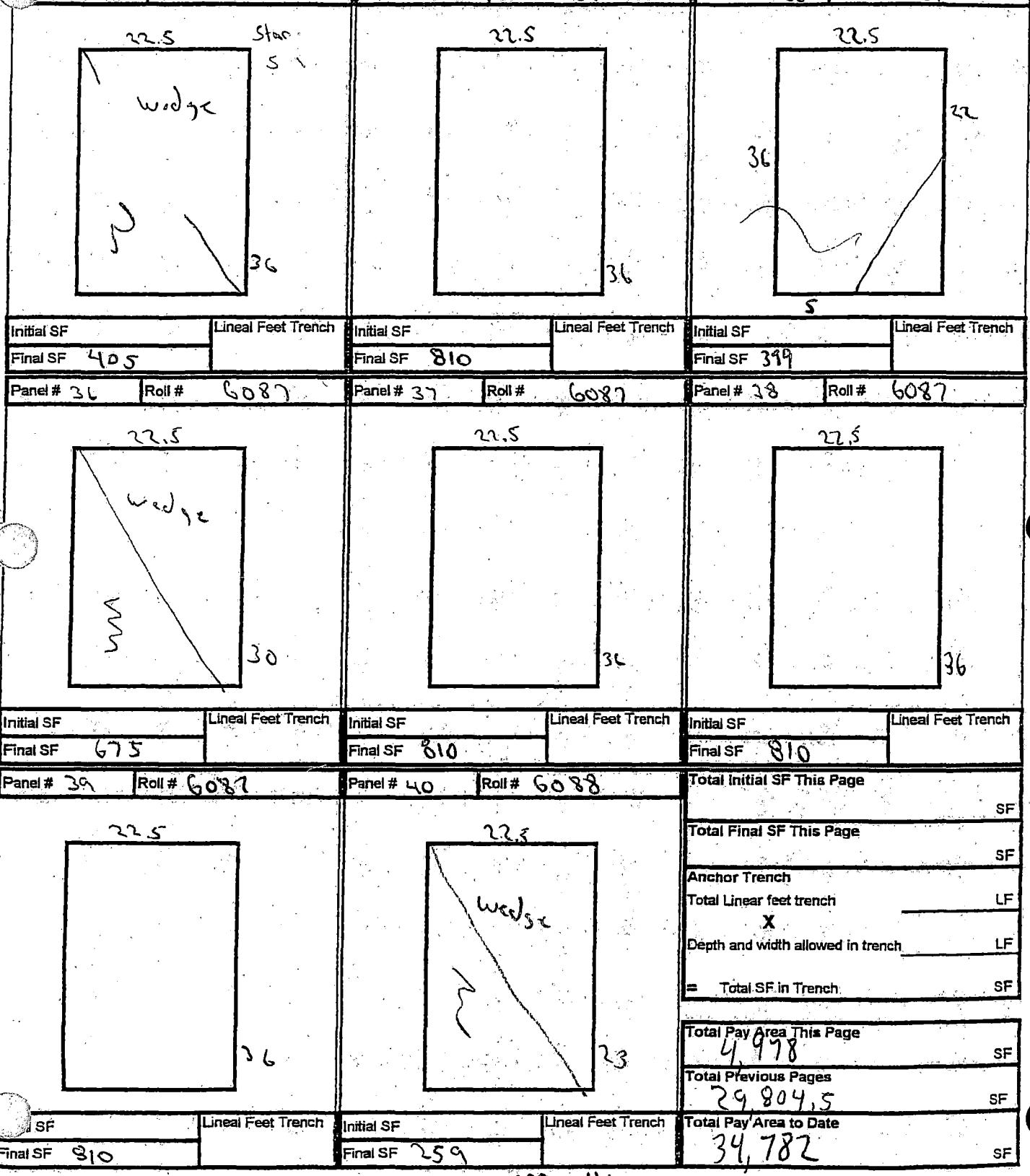
Page _____ of _____

Deployment Date 5-19-15

Project Name: Kenneth Troutman Job #S150010 Supt: Bob vogt

Material: _____ Primary [ ] Secondary [ ] Pond # _____ Cell # _____ Pad # _____ Other: _____

Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
P-33	6087		405	
P-34	6087		810	
P-35	6087		399	
36	6087		675	
37	6087		810	
38	6087		810	
39	6087		810	
40	6088		259	



Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	4,978 SF
Total Previous Pages	29,804.5 SF
Total Pay Area to Date	34,782 SF

4,978 sqft

SGS. Inc
Daily Panel Placement

Page _____ of _____

Deployment Date 5-19-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Vogt

Material: _____ Primary [ ] Secondary [ ] Pond # _____ Cell # _____ Pad # _____ Other: _____

Panel # 41	Roll # 6088	Panel # 42	Roll # 6088	Panel #	Roll #
15 / 33		End 5-19-15 15 / 33			
		4,978 sqft			
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 495		Final SF 495		Final SF	

Panel #	Roll #	Panel #	Roll #	Panel #	Roll #
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF		Final SF		Final SF	

Panel #	Roll #	Panel #	Roll #
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF		Final SF	

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	990 SF
Total Previous Pages	34,782 SF
Total Pay Area to Date	35,772 SF

Total 4 East Ponds

5968 cy 5-19-15

SGS. Inc
Daily Panel Placement

Page _____ of _____

Deployment Date 5-23-15

Project Name: Homestake Zeolite Ponds Job # S1500.10 Supt: Bob vest

Material: 60mil HDPE smooth Primary [ ] Secondary [ ] Pond # X Cell # _____ Pad # _____ Other: _____

Panel # 43	Roll # 6088	Panel # 44	Roll # 6088	Panel # 45	Roll # 6088
22.5 (start 5-23-15)	80	22.5	80	22.5	28
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 1800		Final SF 1800		Final SF 630	

Panel # 46	Roll # 6088	Panel # 47	Roll # 6088	Panel # 48	Roll # 6088
10	23	22.5	28	22.5	28
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 517.5		Final SF 630		Final SF 630	

Panel # 49	Roll # 6088	Panel # 50	Roll # 6088
22.5 (wedge)	30	22.5	31
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 337.5		Final SF 349	

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	6694 SF
Total Previous Pages	35,772 SF
Total Pay Area to Date	42,466 SF

SGS. Inc

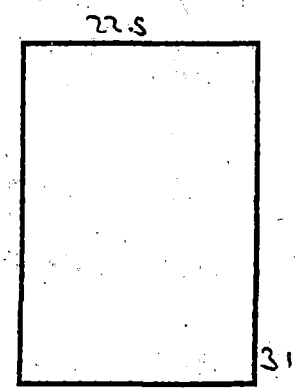
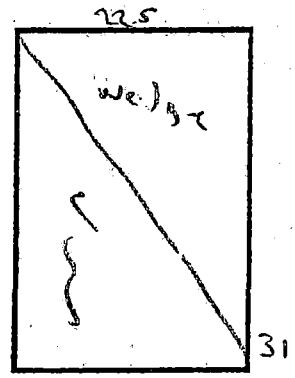
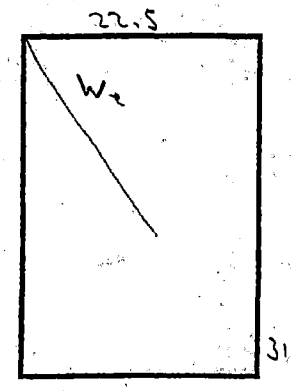
Daily Panel Placement

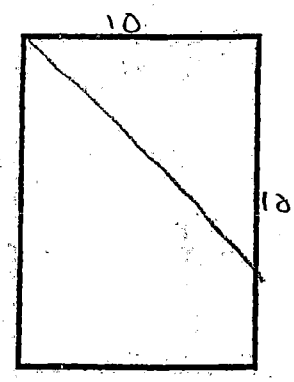
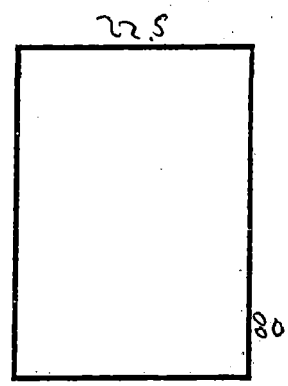
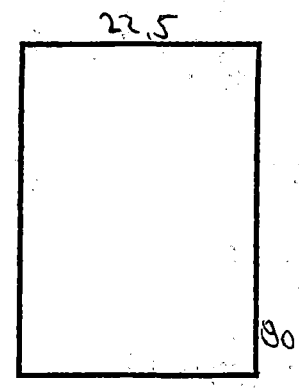
Page _____ of _____

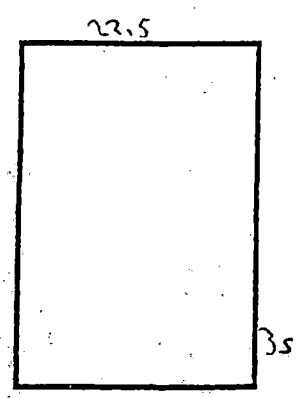
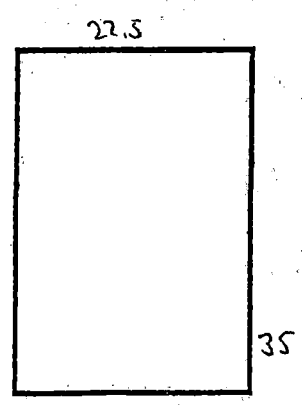
Deployment Date 5-23-15

Project Name: Homestake Zeolite Ponds Job # 5150010 Supt: Bob Vigt

Material: 60 mill HDPE smooth Primary [ ] Secondary [ ] Pond # 2 Cell # _____ Pad # _____ Other: _____

Panel # 51	Roll # 6088	Panel # 52	Roll # 6088	Panel # 53	Roll # 6088
					
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 697.5		Final SF 349		Final SF 349	

Panel # 54	Roll # 6088	Panel # 55	Roll # 6088	Panel # 56	Roll # 6090
					
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 50		Final SF 1800		Final SF 1800	

Panel # 57	Roll # 6090	Panel # 58	Roll # 6090
			
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 787.5		Final SF 787.5	

Total Initial SF This Page _____ SF

Total Final SF This Page _____ SF

Anchor Trench

Total Linear feet trench _____ LF

X

Depth and width allowed in trench _____ LF

= Total SF in Trench _____ SF

Total Pay Area This Page 6620.5 SF

Total Previous Pages 42,466 SF

Total Pay Area to Date 49,086.5 SF

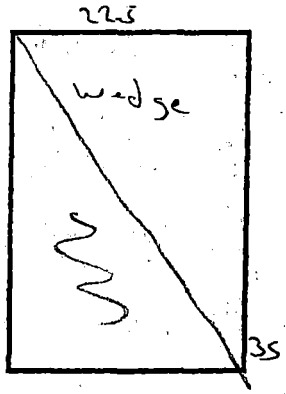
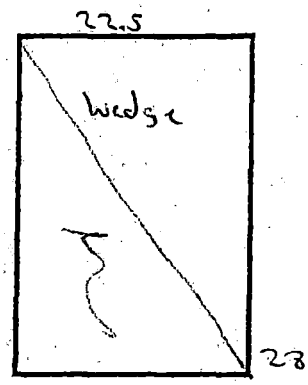
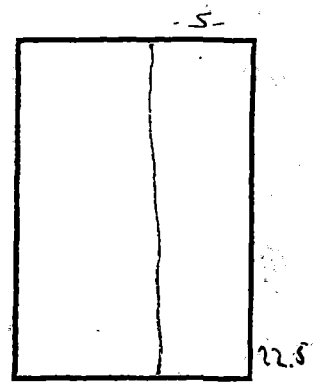
SGS. Inc
Daily Panel Placement

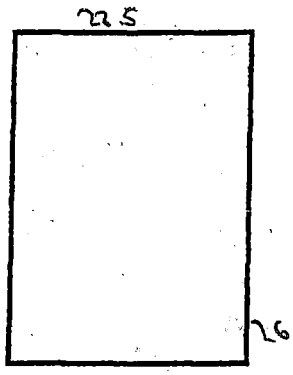
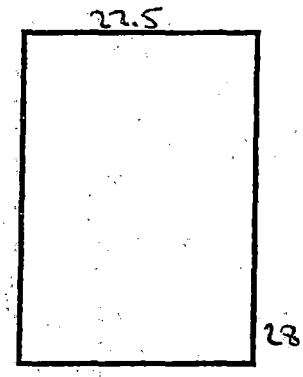
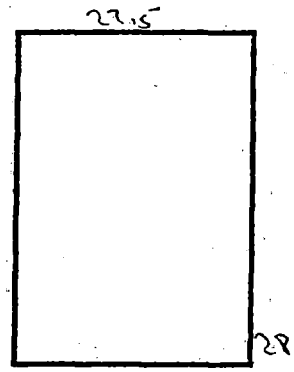
Page _____ of _____

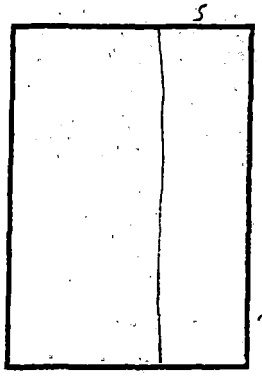
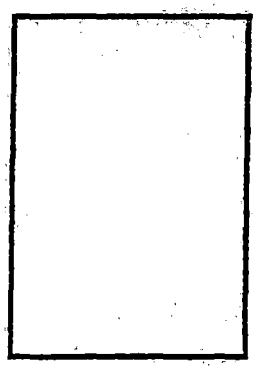
Deployment Date 5-23-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Vogt

Material: _____ Primary [ ] Secondary [ ] Pond # _____ Cell # _____ Pad # _____ Other: _____

Panel # 59	Roll # 6090	Panel # 60	Roll # 6090	Panel # 61	Roll # 6090
					
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 394		Final SF 315		Final SF 45	

Panel # 62	Roll # 6090	Panel # 63	Roll # 6090	Panel # 64	Roll # 6090
					
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 585		Final SF 630		Final SF 630	

Panel # 65	Roll # 6090	Panel #	Roll # 6090
			
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 45		Final SF	

Total Initial SF This Page _____ SF

Total Final SF This Page _____ SF

Anchor Trench

Total Linear feet trench _____ LF

X

Depth and width allowed in trench _____ LF

= Total SF in Trench _____ SF

Total Pay Area This Page 2014 SF

Total Previous Pages 49 086.5 SF

Total Pay Area to Date 51,100.5 SF

15,328.5

SGS. Inc
Daily Panel Placement

Page _____ of _____

Deployment Date 5-26-15

Project Name: Homestake Zeolite Ponds Job # 150010 Supt: Bob Vogt

Material: 60 mil HDPE Smooth Primary [ ] Secondary [ ] Pond # _____ Cell # _____ Pad # _____ Other: _____

Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
66	6090	22.5 × 75	1687.5	
67	6090	22.5 × 75	1687.5	
68	6090	22.5 × 25	562.5	
69	6090	7 × 32	224	
70	6090	22.5 × 26	585	
71	6090	22.5 wedge × 26	292.5	
72	6090	22.5 wedge × 24	270	
73	6083	22.5 × 32	720	

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	6028 SF
Total Previous Pages	51,100.5 SF
Total Pay Area to Date	57,129 SF

Daily Panel Placement

Deployment Date 5-26-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob vogt

Material: 60 mil Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel # 74	Roll # 6083	Panel # 75	Roll # 6083	Panel # 76	Roll # 6083
22.5 / 32		22.5 / wedge / 23		22.5 / 10 / 31	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 720		Final SF 517.5		Final SF 461.25	

Panel # 77	Roll # 6083	Panel # 78	Roll # 6083	Panel # 79	Roll # 6083
22.5 / 10		22.5 / 85		22.5 / 85	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 225		Final SF 1912.3		Final SF 1912.5	

Panel # 80	Roll # 6083	Panel # 81	Roll # 6083
22.5 / 35		22.5 / 24	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 787.5		Final SF 540	

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	7,076.25 SF
Total Previous Pages	57,129 SF
Total Pay Area to Date	64,205.25 SF

Daily Panel Placement

Deployment Date 5-26-15

Project Name: Homestake Isolite Ponds Job # 5150010 Supt: Bob Vogt

Material: 60mil HDPE Smooth Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel # 82	Roll # 6083	Panel # 83	Roll # 6083	Panel # 84	Roll # 6083
22.5 / 30		22.5 / 10		22.5 / 10 / 37	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 675		Final SF 225		Final SF 529	

Panel # 85	Roll # 6083	Panel # 86	Roll # 6083	Panel # 87	Roll # 6083
22.5 / Wedge / 28		22.5 / 10		22.5 / 27	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 315		Final SF 225		Final SF 607.5	

Panel # 88	Roll # 6083	Panel # 89	Roll # 6083
22.5 / Wedge / 26		22.5 / Wedge / 30	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 292.5		Final SF 675	

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	3,543.5 SF
Total Previous Pages	64,205.25 SF
Total Pay Area to Date	67,749 SF

Daily Panel Placement

Page ____ of ____

Deployment Date 5-26-15

Project Name: Homestake Zeolite Ponds Job # 5150010 Supt: Bob Vogt

Material: 60 mil HDPE Smooth Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel #	Roll #	Panel #	Roll #	Panel #	Roll #
90	6083	91	6083		
22.5 × 7		22.5 × 10			
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 157.5		Final SF 225		Final SF	

Panel #	Roll #	Panel #	Roll #	Panel #	Roll #
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF		Final SF		Final SF	

Panel #	Roll #	Panel #	Roll #	
				Total Initial SF This Page ____ SF
				Total Final SF This Page ____ SF
				Anchor Trench Total Linear feet trench ____ LF X Depth and width allowed in trench ____ LF = Total SF in Trench ____ SF
				Total Pay Area This Page 382.5 SF
				Total Previous Pages 67,749 SF
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Total Pay Area to Date 68,131.5 SF
Final SF		Final SF		

17,030.5 sqft
5-26-15 Total

Daily Panel Placement

Deployment Date 5-27-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Vogt

Material: 60 mil HDPE Primary [ ] Secondary [ ] Smooth Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
92	6085	22.5 / 77	1732.5	
93	6085	22.5 / 77	1732.5	
94	6085	22.5 / 76	1710	
95	6085	21 / 76	1596	
96	6085	Down slope ← 22 / 25 (Top of Panel)	550	
97	6085	22.5 / 21	472.5	
98	6085	Down slope 21 / 30 (Top of Panel)	630	
99	6085	22.5 / 78	1755	

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	10,178 SF
Total Previous Pages	68,131.5 SF
Total Pay Area to Date	78,263 SF

Daily Panel Placement

Deployment Date 5-27-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob vogt

Material: 60 mil HDPE Smooth Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel # 100	Roll # 6085	Panel # 101	Roll # 6081	Panel # 102	Roll # 6081
21	21	22.5	22	22.5	78
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 441		Final SF 495		Final SF 1755	

Top of Panel

Panel # 103	Roll # 6081	Panel # 104	Roll # 6081	Panel # 105	Roll # 6081
22.5	78	21	76	21	27
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 1755		Final SF 1710		Final SF 567	

Top of Panel

Panel # 106	Roll # 6081	Panel # 107	Roll # 6081
22.5	77	22.5	77
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 1732.5		Final SF 1732.5	

Total Initial SF This Page ____ SF

Total Final SF This Page ____ SF

Anchor Trench

Total Linear feet trench ____ LF

X

Depth and width allowed in trench ____ LF

= Total SF in Trench ____ SF

Total Pay Area This Page 10,188 SF

Total Previous Pages 78,263 SF

Total Pay Area to Date 88,451 SF

Daily Panel Placement

Deployment Date 5-27-15

Project Name: Homestake Zeolite Ponds Job # _____ Supt: Bob Vogt

Material: 60 mil HDPE Smooth Primary [ ] Secondary [ ] Pond # _____ Cell # _____ Pad # _____ Other: _____

Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
108	6081		1732.5	
109	6086		1232.5	
110	6086		594	
111	6086		472.5	
112	6081		567	
113	6086		1,155	
114	6086		1125	
115	6086		448	

Panel # 108: 22.5 × 77

Panel # 109: 21 × 77

Panel # 110: 22 × 27 (Top of Pond) ← Slope →

Panel # 111: 22.5 × 21

Panel # 112: ← Slope → 21 × 27 (Top of Pond)

Panel # 113: 15 × 77

Panel # 114: 15 × 75

Panel # 115: 7 × 64

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	7,826.5 SF
Total Previous Pages	88 451 SF
Total Pay Area to Date	96,277.5 SF

Daily Panel Placement

Deployment Date 5-27-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Vogt

Material: 60 mil HDPE Primary [ ] Secondary [ ] Smooth Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
116	6086		532	

Total Initial SF This Page ____ SF

Total Final SF This Page ____ SF

Anchor Trench

Total Linear feet trench ____ LF

x

Depth and width allowed in trench ____ LF

= Total SF in Trench ____ SF

Total Pay Area This Page 532 SF

Total Previous Pages 96,277.5 SF

Total Pay Area to Date 96,809.5 SF

Deployment Date 5-23-15

Daily Panel Placement

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Vogt

Material: 60 mil HDPE Smooth Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
117	6086		1822.5	
118	6086		682	
119	6086		492	
120	6089		594	
121	6089		1800	
122	6089		1800	
123	6089		1800	
124	6089		616	

Panel # 117: 22.5 × 81

Panel # 118: ← Slope → 22 × 31 (Top of Panel) ← Slope →

Panel # 119: 22.5 × 22

Panel # 120: ← Slope → 22 × 27 (Top of Panel) ← Slope →

Panel # 121: 22.5 × 80

Panel # 122: 22.5 × 80

Panel # 123: 22.5 × 80

Panel # 124: 8 × 77

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	9,606 SF
Total Previous Pages	96,277 SF
Total Pay Area to Date	105,883 SF

9,606 Total
5-23-15

SEAM CONTROL

S, Inc.
ontrol

Project Name: [illegible] Zeolite Pon
Project Manager: [illegible]
Superintendent: [illegible]
Reported By: [illegible]

Material: 60 mill Smooth HDPE
Location: Grants, NM
Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-14-15	1/2	87	8:47 am pm	JAM	02	50	7		5-20-15	RT	7:30	7:35	P F	
	3/4	35	10 am pm						5-15-15		10:24	10:29	P F	
5-15-15	1/3	31	8:15 am pm								10:23		P F	
	4/6	35	7:00 am pm								9:48	9:53	P F	
	5/6	35	7:40 am pm								10:01	.06	P F	
5-14-15	5/1	35	9:50 am pm									10:07	P F	
5-15-15	7/9	31	7:56 am pm								10:47	10:52	P F	
	8/9	30	8:27 am pm								10:36	10:41	P F	
	8/2	29	8:40 am pm								10:34	10:39	P F	
	7/10	31	9:00 am pm								10:26	10:31	P F	
	2/10	31	9:12 am pm								10:19	10:24	P F	
	4/1	22.5	7:20 am pm								9:48	9:53	P F	
	11/13	51	8:43 am pm								11:00	11:05	P F	
	12/13	22.5	9:26 am pm								11:01	11:06	P F	
	12/14	31	10:03 am pm						5-19-15		2:25	2:30	P F	
	14/15	27	10:22 am pm								2:21	2:26	P F	
	15/16	36	10:33 am pm								2:05	2:10	P F	
	16/13	31	11:03 am pm								1:58	2:03	P F	
	15/13	22.5	10:40 am pm								2:06	2:11	P F	
	R-1/8	22.5	11:31 am pm								1:55	2:00	P F	
	R-1/16	22.5	11:12 am pm								1:56	2:01	P F	
	13/2	22.5	11:33 am pm								1:33	:8	P F	
	11/1	22.5	11:36 am pm								1:20	1:25	P F	
	Total =													

Air Test: 30-35 psi for 5 minutes- 3 psi loss allowed. Tested By: F.A.

S[illegible], Inc.
S[illegible] Control

Pr[illegible] Name: Homestake [illegible]
Project Manager: Tracy [illegible]
Superintendent: Bob [illegible]
Reported By: [illegible]

Material: 60 mill Smooth HDPE
Location: Grants, NM

Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5 15	3/32	22	7 am pm		[illegible]	[illegible]	[illegible]				11:07	11:12	P F	0-22 west
			am pm										P F	
	19/32		8:07 am pm										P F	0-22w
			am pm								11:09	11:14	P F	
	1/32	7	7:40 am pm									11:16	P F	
	11/32	7	7:41 am pm								11:12	11:17	P F	
	11/12	31	9:51 am pm								2:31		P F	
	11/18	22.5	8:45 am pm										P F	
	P18	12	8:22 am pm								3:07	3:12	P F	
	17-18	35	7:24 am pm								2:53	2:58	P F	
	17/19	5	7:34 am pm										P F	
	11/19	28	8:50 am pm								1:31	1:36	P F	
	19/42	22	8:06 am pm										P F	0-22 w
			am pm								11:09	[illegible]	P F	[illegible]
	20/21	86	9:07 am pm								4:50	[illegible]	P F	D/S-2
	21/24	23	9:30 am pm								4:40	4:45	P F	
	24/25	20	10:08 am pm								3:35	3:40	P F	0 10 w
			am pm								3:34	3:39	P F	10w to weds
	25/14	10	10:16 am pm								3:31		P F	
	21/12	2.5	9:55 am pm								3:17	3:22	P F	
	23/24	30	9:40 am pm								5:22	5:27	P F	
	22/23	28	9:28 am pm								5:30	5:35	P F	
	22/21	24	10:50 am pm						5-20-15	At	8:05	8:10	P F	
	Total =													

Air Test: 30-35 psi for 5 minutes- 3 psi loss allowed. Tested By: FA

GSI, Inc.
Seam Control

Project Name: Homestake Zeolite Ponds
Project Manager: Tracy Larson
Superintendent: Bob Vogt
Reported By: Kenneth Trautman

Material: 60mil Smooth HDPE
Location: Grants, NM

Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-18-15	22/31	22.5	11:17 am pm	JAM	021		7		5-20-15			8:35	P F	
	37/20	22.5	1:30 am pm								8:01	8:06	P F	
	P37	22	2:20 am pm									8:08	P F	[illegible]
	37/38		1:05 am pm								8:02	8:04	P F	
	38/39	36	am pm						5-19-15		5:53	5:08	P F	
	47/39	32	2:01 am pm								5:04		P F	
	30/31	22.5	12:13 am pm						5-20-15			8:42	P F	
	30 27		12: am pm								10:43	10:47	P F	0-10 South
			am pm								10:39	[illegible]	P F	1 South
			am pm								10:32	10:37	P F	[illegible]
		29'	11:17 am pm								10:30	10:35	P F	
	28/29	24	am pm								10:29		P F	
	29/27	22.5	11:50 am pm								10:12	10:17	P F	
	27/28	34	11:40 am pm								10:10	10:15	P F	
	26/27		11:00 am pm								9:50	9:55	P F	0- [illegible]
			am pm								9:51	9:56	P F	[illegible]
	26/36	30	11:49 am pm								9:40	9:45	P F	
	41-36	22	11:15 am pm								9:25	9:30	P F	0-10 E
			am pm								9:21	9:26	P F	10- Eros
	41-35	15	11:13 am pm								9:19	9:24	P F	
	35-36	34	10:26 am pm								9:20	9:25	P F	
	37-41	11	11:20 am pm								9:05	9:10	P F	0-10 E
			am pm								8:50	8:55	P F	10- Eros
	Total =													

Air Test: 30-35 psi for 5 minutes- 3 psi loss allowed. Tested By: KA.

Control

Project Name: Homestake Zeolite Pond
Project Manager: Tracy Larson
Superintendent: Bob Post
Reported By: Kenneth Troutman

Material: 60 mil HDPE Smooth **Job#:** S150010
Location: Grants, NM

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-19-15	35/34	36	10:00 am pm	Jam	021	750	7		5-20-15	at	7:10	7:10	P F	
	33/34	36	10:06 am pm								7:00	7:05	P F	
	33/40	37	11:51 am pm								6:50	6:55	P F	
	26/40		11:36 am pm								6:52	6:57	P F	
	34/26	22.5	10:51 am pm								9:13	9:18	P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
	Total =													

Air Test: _____ psi for _____ minutes- _____ psi loss allowed. Tested By: _____

SGS, Inc.
Seam Control

Project Name: Hemistrike Zeolite [illegible]
Project Manager: Trace Larson
Superintendent: Bob Vast
Reported By: Kenneth Trautman

Material: 60 mil HDPE Smooth
Location: Grants, NM

Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-23-15	[illegible]	23	8:06 am pm		2	50					10:56	11:01	P F	
	48/47		7:53 am pm								10:54		P F	
	45/47	24	7:20 am pm									11:04	P F	
	43/45	28	7:31 am pm								11:00	11:05	P F	
	43/47	27.5	7:29 am pm								10:55	11:00	P F	
	44/49	31	9:18 am pm								11:10	11:15	P F	
	49/50	30	9:05 am pm								11:11		P F	
	50/51	31	8:50 am pm								11:13		P F	
	51/44	22.5	9:26 am pm								11:14	4	P F	
	53/51	10	8:18 am pm								11:18		P F	
	53/44	31	am pm								11:17	11:22	P F	
	51/52	31	8:35 am pm								11:20	11:25	P F	
	52/53		8:24 am pm								11:21	11:26	P F	
	43/44	80	7:00 am pm								11:25	11:30	P F	
	5	c	8:27 am pm								11:42	11:47	P F	
	54/53	10	8:17 am pm								11:43	11:48	P F	
	55/56	0	9:43 am pm								11:26	11:31	P F	
	[illegible]		11:32 am pm								11:49	11:54	P F	
	57/65	22.5	8:36 am pm								11:50	11:55	P F	
	56/57	21	11:16 am pm								12:47	12:52	P F	
	57/58	5	11:06 am pm								12:57	12:02	P F	0-21' East
			am pm								12:59	1:04	P F	21-Cross
	59/58	35	10:39 am pm								1:09	1:14	P F	
	Total =													

Air Test: 30 psi for 5 minutes- 3 psi loss allowed. Tested By: FA

S[illegible] Control

Project Name: [illegible]
Project Manager: [illegible]
Superintendent: [illegible]
Reported By: K[illegible]th Trautman

Material: 60 mil HDPE Smooth **Job#:** S150010
Location: Grants, NM

Primary **Secondary** **Other:**

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-23-15	59/60	35	10:51 am pm	Jam		7	7		5-23-15	A+		1:15	P F	W
	58/56	22.5	11:24 am pm									1:10	P F	
	56/60		11:27 am pm									1:16	P F	
	55/64	23	10:23 am pm								1:30	1:35	P F	0-23 north
			am pm								1:29	1:34	P F	
	63/64	28	9:58 am pm									1:36	P F	
	63/55	22.5	10:27 am pm										P F	
	62/63	26	10:05 am pm								1:37	1:42	P F	
	55/62	21	10:34 am pm								1:45	[illegible]0	P F	
	62/61	22.5	11:57 am pm								2:11	2:16	P F	
	48/61	22.5	11:47 am pm								2:05	2:10	P F	
	61/55	10	11:50 am pm									2:08	P F	
	43/55	22.5	9:44 am pm								1:55	2:00	P F	
	44/56	22.5	am pm										P F	
	57/65	22.5	9:36 am pm								11:45		P F	0-10 s
			am pm								11:50		P F	10E to E eos
	53/65	22.5	11:32 am pm									[illegible]xt	P F	0 10 E s
			am pm								11:49	11:54	P F	10 E to E eos
	45/46	22.5	12:41 am pm								2:20	2:25	P F	
	46/10	22.5	1:06 am pm								2:23	2:28	P F	
	46/7	7	1:04 am pm								2:24	2:29	P F	
	47/7	22.5	1:06 am pm						5-26-15	A+	10:47	10:52	P F	
	48/CAP	10	9:50 am pm								10:51	10:56	P F	
	Total =													

Air Test: 30-35 psi for 5 minutes- 3 psi loss allowed. Tested By: F.A

SGS, Inc.
Sea[illegible]ontrol

Project Name: Ho[illegible]
Project Manager: [illegible]
Superintendent:
Reported By:

Material: 60mill
Location: Grants, nm
Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-23-15	9/CAP	10	1:10 am pm	Jpm	021	50	7		5-26-15	Af	10:53	10:58	P F	whole seam
	3	11.5	1:11 am pm								11:20	11:25	P F	
	16/62	22.5	1:13 am pm								11:23	11:28	P F	
	15/63	22.5	1:15 am pm								11:27		P F	
	15/64	4	1:19 am pm								11:33	11:38	P F	
	14/64	22.5	1:21 am pm								11:34	1:39	P F	
5-26-15	66/67	75	7:17 am pm								12:03	12:08	P F	
	68/66	23	8:26 am pm								1:35	1:40	P F	
	68/70	25	7:45 am pm								1:32	1:37	P F	
	70/66	22.5	8:31 am pm								1:33	1:38	P F	
	70/71	26	7:52 am pm								1:38	1:43	P F	
	71/72	26	8:05 am pm								2:00	2:05	P F	
	67/73	22	am pm								12:10	12:15	P F	
	73/74	32	9:27 am pm								12:21	12:26	P F	0-22 East
			am pm								12:20	12:25	P F	22E - Eeos
	74/77	10	9:03 am pm								2:11	2:16	P F	[illegible] Seam
	75/74	23	9:03 am pm								12:26	12:31	P F	
	75/77	22.5	9:46 am pm								2:10	2:15	P F	
	75/76	33	9:15 am pm								1:31	1:36	P F	0-23 SE Corner
			am pm								1:30	1 5	P F	23SE - SE cos
	76/67	31	9:43 am pm								12:25	12:10	P F	whole Seam
	67/74	22.5	9:47 am pm								12:11	12:16	P F	
	78/79	85	10:02 am pm								4:03	4:08	P F	
	Total =													

Air Test: 3 psi for 5 minutes- 3 psi loss allowed. Tested By: F.A

[illegible], Inc.
Sea[illegible] Control

Project Name: [illegible]
Project Manager: [illegible]
Superintendent: 3
Reported By: [illegible]

Material: 60 mill HDPE Smooth
Location: Grants [illegible]

Job#: S 150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-26-15	79/84	37	12:16 am pm	JAM	021		7		5-26-15	At		3:17	P F	[illegible]
	84/90	10	11:46 am pm								2:39	2:44	P F	
	86/90	10	11:48 am pm								2:40	2:45	P F	
	84/75	35	11:50 am pm								3:07	3:12	P F	
	86/85	22.5	11:41 am pm								2:41	2:46	P F	
	86/87	10	11:40 am pm								2:50	2:55	P F	
	85/87	28	11:34 am pm								3:05	0	P F	
	87/79	22.5	12:21 am pm								3:13	3:18	P F	
	88/87	26	11:55 am pm									3:39	P F	
	89/88	33	[illegible] am pm										P F	
	89/79	30	12:24 am pm								3:35	3:40	P F	
	88/78	35	11:16 am pm								3:46	3:51	P F	0-30
	↓	↓	am pm								3:42	3:47	P F	30s to Seas
	80/81	24	[illegible] am pm								3:45		P F	
	81/82	24	10:41 am pm								3:39		P F	
	78/82	30	11:24 am pm								3:38	[illegible]	P F	
	66/78	22.5	1:39 am pm								4:04	4:09	P F	
	72/80	22.5	1:35 am pm								4:10	4:15	P F	0-12 East
	↓	↓	am pm	JAM	021	70	7		5-26-15	At	4:50	4:55	P F	12E to East
	67/79	22.5	am pm	Extruded		Seam		Extrude	Extruded				P F	whole seam
	84/73	22.5	am pm	Extruded			Seam		Extruded				P F	whole seam
	69/68	32	2:25 am pm	JAM	021	750	7		5-26-15	At	5:57	6:02	P F	0-10' west
	↓	↓	am pm	↓	↓	↓	↓		↓	↓	6:00	6:05	P F	10' west-22' west

Total =

Air Test: 30 psi for 5 minutes- 3 psi loss allowed. Tested By: FA

SGS, Inc.
Seam Control

Project Name: Homestake Zeolite Ponds
Project Manager: Tracy Larson
Superintendent: Bob West
Reported By: Kenneth Troutman

Material: 60 mil HDPE Smooth
Location: Grants, NM
Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
	68/69	33	2:26 am pm		021		7		5-26-15	At	6:00	6:05	P F	t w
	68/24		3:03 am pm								5:50	5:55	P F	whole Seam
		22.5	3:06 am pm								5:46	5:51	P F	top lie
	71/22	20	3:09 am pm								5:33		P F	w
	80/CAP	10	3:11 am pm								5:00	5:05	P F	
	25/CAP	10	3:15 am pm								5:02	5:07	P F	
	80/91	22.5	0 am pm								5:03	5:08	P F	0-10' south
			am pm								5:08	3	P F	10's to Seas
	91/30	22.5	3:18 am pm								5:04	5:09	P F	0-10' South
			am pm								5:07		P F	
	81/29	22.5	3:21 am pm								5:11	5:16	P F	w
	81/91	10	11:00 am pm								5:10	5	P F	
	83/81	10	10:40 am pm								5:14		P F	
	83/82	22.5	10:32 am pm								5:17	5:22	P F	
	83/28	22.5	3:28 am pm								5:19	5:24	P F	
5-27-15	92/93	77	6:51 am pm								1:55	2:00	P F	
	93/94	77	7:07 am pm								1:52	1:57	P F	
	94/95	76	7:42 am pm									3:34	P F	
5-26-15	59/76	22.5	2:36 am pm								1:16	1.21	P F	
	56/87	22.5	2:39 am pm								1:11	1:16	P F	
	55/66	22.5	2:31 am pm								1:10	1:15	P F	
5-27-15	96/97	22	8:02 am pm								4:58	5:03	P F	
	97/98	21	am pm										P F	
	Total =													

Air Test: 30-35 psi for 5 minutes- 3 psi loss allowed. Tested By: FA

S, Inc.
Se Control

Project Name: H 2sol Land
Project Manager:
Superintendent: B
Reported By:

Materia: O H 5 north
Locatio

Job#: 1 01

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-27-15	98/92	3	8:32 am pm	m	C21	350	7		5-27-15	At	4:53	4:58	P F	0-17' south
			am pm								4:52	4:57	P F	17's to Seas
	97/92		8:38 am pm								4:55		P F	Wh e m
	96/92	25	8:41 am pm								4:59	5:04	P F	0-7' south
			am pm								5:00		P F	
			am pm								4:19	4:24	P F	19's - Seas
	99/102	78	8:55 am pm								4:07	4:12	P F	Whale 5
		78	9:16 am pm								4:05	4:10	P F	
	103/104	76	10:00 am pm								3:34	3:39	P F	
	100/101	20	11:26 am pm								5:17		P F	
	99/100	27	11:30 am pm								5:45	0	P F	0-13 north
			am pm								5:50	5:50	P F	13 n - Neos
	101/99	22.5	11:35 am pm								5:19	5:24	P F	
	105/99	28	11:41 am pm								5:17	5:22	P F	
	95/104	22.5	2:11 am pm								3:30	3:35	P F	
	103/94	22.5	2:14 am pm								3:32	3:37	P F	
	93/102	22.5	2:17 am pm								3:		P F	
	99/92	22.5	2:20 am pm								4:11	4:16	P F	
	105/96	22.5	2:23 am pm									4:20	P F	
	105/57	28	am pm								5:14	5:19	P F	
	101/58	22.5	am pm								5:16	5:21	P F	
	100/59	27	am pm								5:19	4	P F	
	106/107	77	11:44 am pm						5-28-15		11:21	11:	P F	
	Total =													

Air Test: 0 psi for 5 minutes- 3 psi loss allowed. Tested By: FA

SGS, Inc.
Seam Control

Project Name: H
Project Manager:
Superintendent:
Reported By:

Material: 60 mil HDPE Pond s
Location: Grants, NM
Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp
5-27-15	107/108	77	11:58 am pm	Jam	021		7	
	108/109	77	1:36 am pm					
	110/111	22	12:58 am pm					
			am pm					
	111/112	21	1:10 am pm					
	106/112	27	1 am pm					
	111/106	22.5	1:20 am pm					
	110/106	27	1:17 am pm					
	104/109	22.5	1:50 am pm					
	108/103	22.5	1:50 am pm					
	107/102	22.5	1:56 am pm					
	106/99	22.5	1:59 am pm					
5-27-15	100/112	22.5	2:02 am pm					
	86/112	27	am pm					
	111/74	22.5	am pm					
	110/73	27	am pm					
5-28-15	117/121	81	7:05 am pm					
	121/122	80	7:20 am pm					
	122/123	80	8:00 am pm					
			am pm					
			am pm					
	123/124	77	7:44 am pm					
5-27-15	116/95	76	11:00 am pm					
	Total =							

Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-28-15	A1	11:18	11:23	(P) F	
		11:15	11:20	(P) F	
		11:55	12:00	(P) F	0-8' West
		11:53	11:58	(P) F	8W to W-cos
		11:51	11:56	(P) F	
		11:32	11:37	(P) F	
		1:23	1:28	(P) F	
		12:52	12:57	(P) F	
		10:53	10:58	(P) F	
		11:17	11:22	(P) F	
		11:20	11:25	(P) F	
		11:30	1 5	(P) F	
5-27-15		5:31	5:36	(P) F	
		5:33	5:38	(P) F	
5-28-15		11:50	11:55	(P) F	
		12:45	12:50	(P) F	
		1:05	1:10	(P) F	
		1:07	1:17	(P) F	
		8:08	8:13	(P) F	0-15 south
		2:05	2:10	(P) F	15-64 south
		2:06	2:11	(P) F	64-Seos
		1:16	1:21	(P) F	
5-27-15		3:45	3:50	(P) F	

Air Test: 30 psi for 5 minutes- 3 psi loss allowed. Tested By: F.A.

S, Inc.
S[illegible]ontrol

Project Name: H[illegible]
Project Manager: [illegible]
Superintendent: [illegible]
Reported By: [illegible]

Material: [illegible]
Location: [illegible]

Job#: S15000

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-27-15	95/114	10	8 am pm	JAM		5	7		5-27-15	HL	3:31	3:47	P F	Whole [illegible]
	104/114	74	10:23 am pm								47	3:52	P F	
	114/115	64	10:49 am pm						5-28-15		4:15	4:20	P F	
	113/104	10	10:40 am pm								10:54	10:59	P F	
	109/113		10:21 am pm								10:50	10:55	P F	
5-28-15	118/119	23	8:17 am pm								1:53	1:58	P F	
	120/119	22	8:23 am pm								1:50	1:55	P F	
	113/124	8	8:55 am pm								1:15	1:12	P F	
	109/123	22.5	8:56 am pm								1:11	1:16	P F	
	108/122	22.5	8:59 am pm								1:08	1:13	P F	
	107/121	22.5	9:02 am pm								1:02	1:07	P F	
	106/117	17.5	9:05 am pm								12:53	12:58	P F	
	117/110	5	9:08 am pm								1:00	1:05	P F	
	118/110	18	9:08 am pm								12:44	12:49	P F	
	86/118	31	9:12 am pm								12:46	12:51	P F	0-3' south
			am pm								12:50	12:55	P F	3's - Seas
	118/87	22.5	9:15 am pm								1:39	1:44	P F	Whole seam
	120/88	27	9:18 am pm								1:40	1:45	P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	

Total =

Air Test: 30-35 psi for 5 minutes- 3 psi loss allowed. Tested By: FA

REPAIR REPORTS

SGS, Inc.
Construction Repair Report

Page: 1

Project Name: Homestake Zeolite Ponds
Project Manager: Tracy Larson
Supintendent: Bob West

[X] HDPE
[ ] HDT
[ ] PPR
[ ] Other: Smooth

Date: 5-20-15
Job#: S150010
Thickness: 60 mil

Primary Secondary Other

VT=Vacum Test ST=Spark Test PT=Probe Test

Repair Number	Damage Code	Seam # or Panel #	Location	Repair Type	Approx. Size	Test Data: Test	Test Data: Results	Test Data: Date
1	CAP	16/8	Wholeseam capped	CAP	22x5	VT ST (PT)	(P) F	5-20-5
2	P	R-1/8	5' w	P	2x2	(VT) ST PT	P F	
3	P	R-1/8	11' w	P	2x2	VT ST PT	P F	
4	T	2-8-9-7	T Patch	T	4x2	VT ST PT	P F	
5	T	7-10-2	T Patch	T	4x2	VT ST PT	P F	
6	Bo	10/2	At anchor trench	P	4x2	VT ST PT	P F	
7	T	3/1/4	T Patch	P	2x2	VT ST PT	P F	
8	T	4-5-6	T Patch	P	2x2	VT ST PT	P F	
9	Patch	5-6	Corner Anchor Trench Patch	P	4x3	VT ST PT	P F	
10	P	3-32	22' west	P	2x2	VT ST PT	P F	
11	T	2-8-16-13	T Patch	P	4x2	VT ST PT	P F	
12	T	1-2-13-11	T Patch	P	2x2	VT ST PT	P F	
13	P	19-32	22, west	P	2x2	VT ST PT	P F	
14	T	19-11-32	T Patch	P	2x2	VT ST PT	P F	
15	T	1-11-32	T Patch	P	2x2	VT ST PT	P F	
16	T	1-3-32	T Patch	P	2x2	VT ST PT	P F	
17	DS-1	11/13	40' south	P	4x2	VT ST PT	P F	
18	WR	16/13	5' north + 10' East (ext)	P	3x2	VT ST PT	P F	
19	T	16-15-13	T Patch	P	2x2	VT ST PT	P F	
20	T	15-14-12 13	T Patch	P	2x2	VT ST PT	P F	
21	T	11-12 13	T Patch	P	2x2	VT ST PT	P F	
22	T	19-17 11	T Patch	P	2x2	VT ST PT	P F	
23	T	11-18-17	T Patch	P	2x2	VT ST PT	P F	
24	P	P-18	2' E of 11/13 in corner floor	P	2x2	VT ST PT	P F	
25	CAP	14-25	10' west	CAP	10x2	VT ST PT	P F	
26	T	25-12-21	T Patch	T	2x2	VT ST PT	P F	
27	P	24-25	10' west	T	2x2	VT ST PT	P F	
28		21-24-25	T Patch	T	2x2	(VT) ST PT	(P) F	

Vacum Test: PSI for Seconds. Probe Test: PSI.

Damage Codes:

Bo - Burn Out
CR - Crease
DS-# Destruct Sample
EE - Earthwork Equipment Damage
FM - Fish Mouth
ES- Exposed Scrim
SI - Subgrade Irregularity
RW- Roller Wrinkle in Seam
WR - Wrinkle
WS - Welder Restart
BL - Blister
T - Joint

Repair Types:

C - Cap Strip
P - Patch
B - Extrusion Bead

* TOS - Top of Slope
** BOS - Toe of Slope

SGS, Inc.
Construction Repair Report

Page: 2

Project Name: Homestake Zeolite Ponds

Project Manager: Tracy

Supintendent: Bob Vogt

[X] HDPE
[ ] HDT
[ ] PPR
[ ] Other: Smooth

Date: 5-20-15

Job#: S150010

Thickness: 60 mill

Primary Secondary Other

VT=Vacum Test ST=Spark Test PT=Probe Test

Repair Number	Damage Code	Seam # or Panel #	Location	Repair Type	Approx. Size	Test Data: Test	Test Data: Results	Test Data: Date
29	T	11-12-20-21	T Patch	T	2x2	(VT) ST PT	(P) F	5-20-15
30	T	41-39-20	T Patch	T	2x2	VT ST PT	P F	
31	T	11-20-42	T Patch	T	2x2	VT ST PT	P F	
32	T	18-42-11	T Patch	T	2x2	VT ST PT	P F	
33	WR	42-18-	10' west of Anchor Trench	P	3x2	VT ST PT	P F	
34	P	41-39	15 west of anchor	P	2x2	VT ST PT	P F	
35	T	38-39-20	T Patch	P	2x2	VT ST PT	P F	
36	T	37-38-20	T Patch	P	2x2	VT ST PT	P F	
37	DIS-2	20-21	DIS-2 43' south	P	4x2	VT ST PT	P F	
38	WR	39-20	3' north of corner	P	2x2	VT ST PT	P F	
39	WR	P-37	At Bottom Corner	P	3x3	VT ST PT	P F	
40	WR	24-21	from 23-24 21 T to 5' north	P	5x2	VT ST PT	P F	
41	WR	23-21	5' north	P	2x2	VT ST PT	P F	
42	T	21-22-23	T Patch	P	2x2	VT ST PT	P F	
43	T	31-22-27 21	T Patch	P	3x3	VT ST PT	P F	
44	T	31-30-27	T Patch	P	2x2	VT ST PT	P F	
45	P	30-27	10' south	P	2x2	VT ST PT	P F	
46	P	↓	15' south	P	2x2	VT ST PT	P F	
47	T	29-30 27	T Patch	P	4x2	VT ST PT	P F	
48	T	20-21 26-27	T Patch	P	2x2	VT ST PT	P F	
49	CAP	41-26	whole seam & T 36-26 41	P	5x2	VT ST PT	P F	
50	CAP	41-20	" " " 20-41 37	P	5x2	VT ST PT	P F	
51	P	41-36	11' east	P	2x2	VT ST PT	P F	
52	T	41-35-36	T Patch	P	2x2	VT ST PT	P F	
53	WR	41-37	10' west	P	2x2	VT ST PT	P F	
54	T	34-35-36 26	T Patch	P	3x2	VT ST PT	P F	
55	T	40-33-34 26	T Patch	P	2x2	VT ST PT	P F	
56	DIS-3	26-27	DIS-3 10' south	P	4x2	(VT) ST PT	(P) F	

Vacum Test: PSI for Seconds. Probe Test: PSI.

Damage Codes:

Bo - Burn Out
CR - Crease
DS-# Destruct Sample
EE - Earthwork Equipment Damage
FM - Fish Mouth
ES- Exposed Scrim
SI - Subgrade Irregularity
RW- Roller Wrinkle in Seam
WR - Wrinkle
WS - Welder Restart
BL - Blister
T - Joint

Repair Types:

C - Cap Strip
P - Patch
B - Extrusion Bead

* TOS - Top of Slope
** BOS - Toe of Slope

SGS, Inc.
Construction Repair Report

Page: 8

Project Name: Homestake Zeolite Ponds
Project Manager: Tracy Larson
Supintendent: Bob Kost

[X] HDPE
[ ] HDT
[ ] PPR
[ ] Other: Smooth

Date: 5-20-15
Job#: S150010
Thickness: 60 mil

Primary Secondary Other

VT=Vacum Test ST=Spark Test PT=Probe Test

Repair Number	Damage Code	Seam # or Panel #	Location	Repair Type	Approx. Size	Test Data: Test	Results	Date
57	Bo	26/27	33' south	P	2x2	(VT) ST PT	P F	5-20-15
58	T	28-29	T	P	2x2	VT ST PT	P F	
60	Boots	P-29	3 Boots midpanel & 10' East	Boot		VT (ST) PT	P F	
61	1-Boot	P-34	1 Boot 8's & 20' of Anchor	Boot		VT ST PT	P F	
62	1-Boot	P-38	midpanel & 20' of anchor	Boot		VT ST PT	P F	
63	3-Boots	P-23	3 Boots midpanel & 10' East	Boots		VT ST PT	P F	
64	3-Boots	P-15	3 Boots midpanel & 16' East	Boots		VT ST PT	P F	
65	1-Boot	P-17	1-Boot midpanel & 23' West	1		VT ST PT	P F	
66	1-Boot	P-4	mid panel & 23' of Anchor Trench	1		VT (ST) PT	P F	
67	3-Boots	P-2	mid panel & 10' East	1		VT ST PT	P F	
	DS-4	43-44	South end of seam	P	4x2	(VT) ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	

Vacum Test: PSI for Seconds. Probe Test: PSI.

Damage Codes:

Bo - Burn Out
CR - Crease
DS-# Destruct Sample
EE - Earthwork Equipment Damage
FM - Fish Mouth
ES- Exposed Scrim
SI - Subgrade Irregularity
RW- Roller Wrinkle in Seam
WR - Wrinkle
WS - Welder Restart
BL - Blister
T - Joint

Repair Types:

C - Cap Strip
P - Patch
B - Extrusion Bead

* TOS - Top of Slope
** BOS - Toe of Slope

SGS, Inc.
Construction Repair Report

Page: 4

Project Name: Homestake Zeolite Ponds

Project Manager: Tracy Larson

Supintendent: Bob Vogt

X	HDPE
	HDT
	PPR
	Other: Smooth

Date: 5-26-15

Job#: S150010

Thickness: 60

Primary Secondary Other

VT=Vacum Test ST=Spark Test PT=Probe Test

Repair Number	Damage Code	Seam # or Panel #	Location	Repair Type	Approx. Size	Test Data: Test	Test Data: Results	Test Data: Date
68	T	51-52 53	T Patch	P	2x2	VT ST PT	P F	5-26-15
69	T	51-44 53	T Patch	P	2x2	VT ST PT	P F	
70	T	52-53 54	T Patch	P	2x2	VT ST PT	P F	
71	T	44-49-50 51	T Patch	P	3x2	VT ST PT	P F	
72	T	43-45 47	T Patch	P	2x2	VT ST PT	P F	
73	WR	45	5' north + 2' East of 43/45	P	2x2	VT ST PT	P F	
74	WR	47-48 43	5' South + 2' East from 43/48	P	2x2	VT ST PT	P F	
75	Cap	9/48	from Neos to 10' south	Cap	10x3	VT ST PT	P F	
76	T	45-46-47	T Patch	P	2x2	VT ST PT	P F	
77	T	10-7-46	T	P	2x2	VT ST PT	P F	
78	T	48-47 Cap 9-7	T	P	3x2	VT ST PT	P F	
79	T	16-62-61 48-39-R1	T 16-62-61-48-8-9-R-1	P	8x8	VT ST PT	P F	
80	Bo	61-62	5' west	P	2x2	VT ST PT	P F	
81	T	43-55 48-61	T Patch	P	2x2	VT ST PT	P F	
82	T	55-62 61	T	P	2x2	VT ST PT	P F	
83	T	55-56 43-55	T	P	2x2	VT ST PT	P F	
84	T	57-56 65-53-44	T 59-56 65-53-44	P	3x2	VT ST PT	P F	
85	T	65-53-57	10' East on P-65	P	3x2	VT ST PT	P F	
86	WR	57-58	10' west	P	2x2	VT ST PT	P F	
87	WR	P-58	5' South of R-86	P	2x2	VT ST PT	P F	
89	T	58-59-60 56	T Patch	P	2x2	VT ST PT	P F	
90	T	55-64-63	T	P	2x2	VT ST PT	P F	
91	T	55-63 62	T	P	4x3	VT ST PT	P F	
92	T	15-16 63-62	T	P	2x2	VT ST PT	P F	
95	DS-5	63-15	DS-5 2' north	P	4x2	VT ST PT	P F	
96	T	15-14 64-63	T Patch	P	2x2	VT ST PT	P F	
97	T	64-15 63-	T Patch	P	2x2	VT ST PT	P F	
98	T	69-64-14	T Patch	P	2x2	VT ST PT	P F	5-26-15

Vacum Test: PSI for Seconds. Probe Test: PSI.

Damage Codes:

Bo - Burn Out
CR - Crease
DS-# Destruct Sample
E - Earthwork Equipment Damage
M - Fish Mouth
ES- Exposed Scrim
SI - Subgrade Irregularity
RW- Roller Wrinkle in Seam
WR - Wrinkle
WS - Welder Restart
BL - Blister
T - Joint

Repair Types:

C - Cap Strip
P - Patch
B - Extrusion Bead

* TOS - Top of Slope
** BOS - Toe of Slope

SGS, Inc.
Construction Repair Report

Page: 5

Project Name: Homestake Zeolite Ponds
Project Manager: Tracy Larson
Supintendent: Bob vost

[X] HDPE
[ ] HDT
[ ] PPR
[ ] Other: Smooth

Date: 5-28-15
Job#: S 1500 10
Thickness: 60 mill

Primary Secondary Other

VT=Vacum Test ST=Spark Test PT=Probe Test

Repair Number	Damage Code	Seam # or Panel #	Location	Repair Type	Approx. Size	Test Data: Test	Test Data: Results	Test Data: Date
99	T	69-14 35	T Patch	P	2x2	(VT) ST PT	(P) F	5-28-15
100	T	14-25 12	From T to 10' west	P	10x2	VT ST PT	P F	
101	T	69-68 24	T Patch	P	2x2	VT ST PT	P F	
102	T	70-69 24-23	↓	P	↓	VT ST PT	P F	
103	D/S-7	23-70	5' north D/S-7	P	4x2	VT ST PT	P F	
104	T	65-69 70	T-Patch	P	2x2	VT ST PT	P F	
105	T	70-71 66				VT ST PT	P F	
106	T	70-71 23				VT ST PT	P F	
107	T	22-23 71				VT ST PT	P F	
108	T	71-72 80-CAP				(VT) ST PT	P F	
109	CAP	71-80	CAP	P	10x2	VT ST (PT)	P F	
110	T	71-72 66	T-Patch	P	2x2	(VT) ST PT	P F	
111	Bo	71-72	10' S.E	P	2x2	VT ST PT	P F	
112	Bo	66-72	2' south	P	2x2	VT ST PT	P F	
113	T	67-73-74	T Patch	P	2x2	VT ST PT	P F	
114	WR	73-74	12' west	P	2x2	VT ST PT	P F	
115	T	59-60 76	T Patch	P	2x2	VT ST PT	P F	
116	T	57-76 60 56	T Patch	P	2x2	VT ST PT	P F	
117	T	66-67 57-55	T Patch	P	2x2	VT ST PT	P F	
118	T	68-69 64	T Patch	P	5x2	VT ST PT	P F	
119	T	69-64 68	10' west	P	10x2	VT ST PT	P F	
120	D/S-6	80-78	D/S-6 3' south	P	4x2	VT ST PT	P F	
121	WR	80-78	10' north	P	2x2	VT ST PT	P F	
122	T	78-80 8	T Patch	P	2x2	VT ST PT	P F	
123	T	78-81 82	T Patch	P	2x2	VT ST PT	P F	
124	WR	P-82	4' S.E. of P-123	P	4x2	VT ST PT	P F	
125	BO	82-81	5' west	P	2x2	VT ST PT	P F	
126	T	82-83 81	T Patch	P	2x2	(VT) ST PT	(P) F	5-28-15

Vacum Test: PSI for Seconds. Probe Test: PSI.

Damage Codes:

Bo - Burn Out
CR - Crease
DS-# Destruct Sample
EE - Earthwork Equipment Damage
FM - Fish Mouth
ES- Exposed Scrim
SI - Subgrade Irregularity
RW- Roller Wrinkle in Seam
WR - Wrinkle
WS - Welder Restart
BL - Blister
T - Joint

Repair Types:

C - Cap Strip
P - Patch
B - Extrusion Bead

* TOS - Top of Slope
** BOS - Toe of Slope

SGS, Inc.
Construction Repair Report

Page: 6

Project Name: Homestake Zeolite Ponds

Project Manager: Tracy Larson

Supintendent: Bob Kept

X	HDPE
	HDT
	PPR
	Other: Smooth

Date: 5-28-15

Job#: S150010

Thickness: 60 mil

Primary Secondary Other

VT=Vacum Test ST=Spark Test PT=Probe Test

Repair Number	Damage Code	Seam # or Panel #	Location	Repair Type	Approx. Size	Test Data: Test	Test Data: Results	Test Data: Date
127	T	28-83 29	T Patch	P	6x2	VT ST PT	P F	5-28-15
128	Bo	82-83	At Trench	P	2x2	VT ST PT	P F	
129	Bo	83-28	At Trench	P	2x2	VT ST PT	P F	
130	Boot	P-83	Boot 10' north mid panel	Boot	12in	VT ST PT	P F	
131	T	79 85 84	T Patch	P	2x2	VT ST PT	P F	
132	T	84-85 85	T Patch	P	2x2	VT ST PT	P F	
133	T	88-89-87	T Patch	P	2x2	VT ST PT	P F	
134	T	99-73 84	T Patch	P	2x2	VT ST PT	P F	
135	T	73-67 84-79	T Patch	P	2x2	VT ST PT	P F	
136	T	78-79 67-66	T Patch	P	2x2	VT ST PT	P F	
137	T	80-78 66-72	T Patch	P	2x2	VT ST PT	P F	
138	WR	95-94	16' north Bottom corner	P	3x2	VT ST PT	P F	
139	WR	95-94	16' South Bottom Corner	P	3x2	VT ST PT	P F	
140	Bo	92-96	5' north on crest of Berm	P	3x2	VT ST PT	P F	
141	Bo	92-96	15' north	P	3x2	VT ST PT	P F	
142	T	96-97 92	T - Patch	P	2x2	VT ST PT	P F	
143	Bo	96-97	From crest of slope to 5' west	P	5x2	VT ST PT	P F	
144	Bo	92-98	15' south from Trench	P	3x2	VT ST PT	P F	
145	T	97-98 92	T Patch	P	2x2	VT ST PT	P F	
150	T	48-50 48	T Patch At Trench	P	3x2	VT ST PT	P F	
151	T	50-51 98	T Patch	P	2x2	VT ST PT	P F	
152	T	97-98 51	" "	P		VT ST PT	P F	
153	T	51-52 96-97	" "	P		VT ST PT	P F	
154	T	54-52 96	"	P	2x2	VT ST PT	P F	
155	Bo	52-96	10' north	P	3x3	VT ST PT	P F	
156	T	52-53 54	T- Patch	P	2x2	VT ST PT	P F	
157	T	105-96 54-57-65	" "	P		VT ST PT	P F	
158	T	54-53 65	" "	P		VT ST PT	P F	

Vacum Test: PSI for Seconds. Probe Test: PSI.

Damage Codes:

Bo - Burn Out
CR - Crease
DS-# Destruct Sample
EE - Earthwork Equipment Damage
FM - Fish Mouth
ES- Exposed Scrim
SI - Subgrade Irregularity
RW- Roller Wrinkle in Seam
WR - Wrinkle
WS - Welder Restart
BL - Blister
T - Joint

Repair Types:

C - Cap Strip
P - Patch
B - Extrusion Bead

* TOS - Top of Slope
** BOS - Toe of Slope

SGS, Inc.
Construction Repair Report

Page: 7

Project Name: Homestake Zeolite Ponds
Project Manager: Tracy Larson
Supintendent: Bob Vogt

[X] HDPE
[ ] HDT
[ ] PPR
[ ] Other:

Date: 5-29-15
Job#: S150010
Thickness: 60

Primary Secondary Other

VT=Vacum Test ST=Spark Test PT=Probe Test

Repair Number	Damage Code	Seam # or Panel #	Location	Repair Type	Approx. Size	Test Data: Test	Test Data: Results	Test Data: Date
159	DS-8	92-93	DS-8 S. end of Seam	P	4x3	(VT) ST PT	(P) F	5-29-15
160	DS-9	99-102	DS-9 2ft South	P	4x3	VT ST PT	P F	
161	T	99-105 96-92	T- Patch	P	3x2	VT ST PT	P F	
162	Bo	99-105	At Crest of Slope	P	2x2	VT ST PT	P F	
163	T	99-105 101	T. Patch	P	2x2	VT ST PT	P F	
164	T	102-103 93-94	T. Patch	P	3x2	VT ST PT	P F	
165	T	103-104 94-95	T. Patch	P	3x2	VT ST PT	P F	
166	Bo	103-104	15' south	P	2x2	VT ST PT	P F	
167	Bo	103-104	15' north	P	2x2	VT ST PT	P F	
168	T	116-95 114	T. Patch	P	2x2	VT ST PT	P F	
169	T	116-104 95	T- Patch & Bo	P	6x2	VT ST PT	P F	
170	E corner	114-115	S.W. corner of P 115 on 114	P	2x2	VT ST PT	P F	
171	T	113-104 104	T. Patch	P	2x2	VT ST PT	P F	
172	T	108-109 104-103	T. Patch	P	2x2	VT ST PT	P F	
173	T	107-108 103-103	T. Patch	P	2x2	VT ST PT	P F	
174	P/S-10	99-102 106-107	T+DS 10 At "T" P. On 106/107	P	2x2	VT ST PT	P F	
175	T	99-100 106-112	T Patch	P	3x2	VT ST PT	P F	
176	WR	99-100	15' north	P	3x2	VT ST PT	P F	
177	T	100-101 99	T- Patch	P	2x2	VT ST PT	P F	
178	T	101-100 58-59	T - Patch	P	2x2	VT ST PT	P F	
179	T	100-112 77-75-76	T Patch	P	2x2	VT ST PT	P F	
180	WR	112-106	16' south	P	2x2	VT ST PT	P F	
181	T	106 111-112	T- Patch	P	2x2	VT ST PT	P F	
182	T	114-112 77-74	T - Patch	P	2x2	VT ST PT	P F	
183	DS-11	74-111	DS-11 5' South	P	2x2	VT ST PT	P F	
184	T+Bo	110-111 106	from T to 4' south	P	5x2	VT ST PT	P F	
185	T	110-118 73-84	T	P	3x3	VT ST PT	P F	
186	Bo	86-118	3' south	P	2x2	VT ST PT	P F	5-29-15

Vacum Test: PSI for Seconds. Probe Test: PSI.

Damage Codes:

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SGS, Inc.
Construction Repair Report

Page: 8

Project Name: Homestake Zeolite Ponds
Project Manager: Tracy Larson
Supintendent: Bob Vogt

[X] HDPE
[ ] HDT
[ ] PPR
[ ] Other: Smooth

Date: 5-29-15
Job#: S150010
Thickness: 60 mil

Primary Secondary Other

VT=Vacum Test ST=Spark Test PT=Probe Test

Repair Number	Damage Code	Seam # or Panel #	Location	Repair Type	Approx. Size	Test Data: Test	Results	Date
187	WR	113-117	10' south	P	2x2	VT ST PT	P F	5-29-15
188	WR	P117	4' west of R 187	P	2x2	VT ST PT	P F	
189	T	118-117 110	T-Patch	P	2x2	VT ST PT	P F	
190	T	119-118 117	T-Patch	P	2x2	VT ST PT	P F	
191	T	120-119 117	↓	↓	↓	VT ST PT	P F	
192	T	120-119 97-98	↓	↓	↓	VT ST PT	P F	
193	D/S-13	120-88	D/S-13 10' south	P	4x2	VT ST PT	P F	
194	WR	117-120	16' north	P	2x2	VT ST PT	P F	
195	T	106-110 117	T Patch	P	2x2	VT ST PT	P F	
196	T	106-107 117-121	T Patch	P	2x2	VT ST PT	P F	
197	T	121-122 108-107	T Patch	P	2x2	VT ST PT	P F	
198	T	123-122 109-108	T Patch	P	2x2	VT ST PT	P F	
199	WR	123-122	18' south	P	3x2	VT ST PT	P F	
200	WR	123-122	16' north from Trench	P	3x2	VT ST PT	P F	
201	T+CAP	123-124 109-113	From T to 12' north on 109/113	P	10x2	VT ST PT	P F	
202	D/S-12	123-124	D/S-12 30' south	P	4x2	VT ST PT	P F	
203	Bo	124-113	At Trench	P	2x2	VT ST PT	P F	
204	3-Boots	P-47	mid panel at crest of Berm	Boots 8in		VT ST PT	P F	
205	3-Boots	P-51	2 ft from crest + mid panel	Boots 8in		VT ST PT	P F	
206	3 Boots	P-97	At crest + mid panel	↓	↓	VT ST PT	P F	
207	3 Boots	P-58	2' ft from crest + mid panel	↓	↓	VT ST PT	P F	
208	3 Boots	P-63	At crest + mid panel	↓	↓	VT ST PT	P F	
209	3 Boots	P101	At crest + mid panel	↓	↓	VT ST PT	P F	
210	3-Boots	P-74	2' ft from crest + mid panel	↓	↓	VT ST PT	P F	
211	3-Boots	P-70	At crest + mid panel	↓	↓	VT ST PT	P F	
212	3-Boots	P-111	At crest + mid panel	↓	↓	VT ST PT	P F	
213	3-Boots	P-87	2' ft from crest + mid panel	↓	↓	VT ST PT	P F	
214	3-Boots	P-81	At crest + mid panel	↓	↓	VT ST PT	P F	

Vacum Test: PSI for Seconds. Probe Test: PSI.

Damage Codes:

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SGS, Inc.
Construction Repair Report

Page: 9

Project Name: Homestake Zeolite Ponds
Project Manager: Tracy Larson
Supintendent: Bob Vogt

X	HDPE
	HDT
	PPR
	Other: Smooth

Date: 6-1-15
Job#: S150010
Thickness: 60 mil

Primary Secondary Other

VT=Vacum Test ST=Spark Test PT=Probe Test

Repair Number	Damage Code	Seam # or Panel #	Location	Repair Type	Approx. Size	Test Data: Test	Results	Date
215	WR	P-109	Crest of N.W Corner Top	cut	20LF	VT ST PT	P F	6-1-15
216	WR	P 112	Top crest of N.E corner	cut	10LF	VT ST PT	P F	
217	WR	P.80	from Top of N.E corner to Toe	Cut	20LF	VT ST PT	P F	
218	WR	P.68	Top crest of N.E corner	cut	15LF	VT ST PT	P F	
219	WR	P-64	Top of N.E corner	cut	5LF	VT ST PT	P F	
220	WR	P-62	Top of N.E corner to 16/62	cut	12LF	VT ST PT	P F	
221	WR	P.48	Top of S.E corner to 10' SE.	cut	10LF	VT ST PT	P F	
222	WR	P-100	Top of S.E corner to 10' SE.	cut	10LF	VT ST PT	P F	
223	WR	P.104	Top of N.W corner to 10 NW.	cut	10LF	VT ST PT	P F	
224	cut	P.97	from 92/96/97 to 12' N.W sump	cut	12LF	VT ST PT	P F	
225	cut	P.99	from 101/105/99 to 12' SW. sump	cut		VT ST PT	P F	
226	cut	P-74	from 69/74 mid-seam sump to 12' SW.	cut	12LF	VT ST PT	P F	
227	cut	P.117	from 117/118/119 to 12' S.W sump	cut	12LF	VT ST PT	P F	
228	cut	P-106	from 106/117/180 to 12' N.W sump	cut	12LF	VT ST PT	P F	
229	cut	P-58	middle of Sump		12LF	VT ST PT	P F	
230	cut	P.87/79	mid ~ of Sump S.S. on Seam	cut	12LF	VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	
						VT ST PT	P F	

Vacum Test: PSI for Seconds. Probe Test: PSI.

Damage Codes:

Bo - Burn Out
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WR - Wrinkle
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Repair Types:

C - Cap Strip
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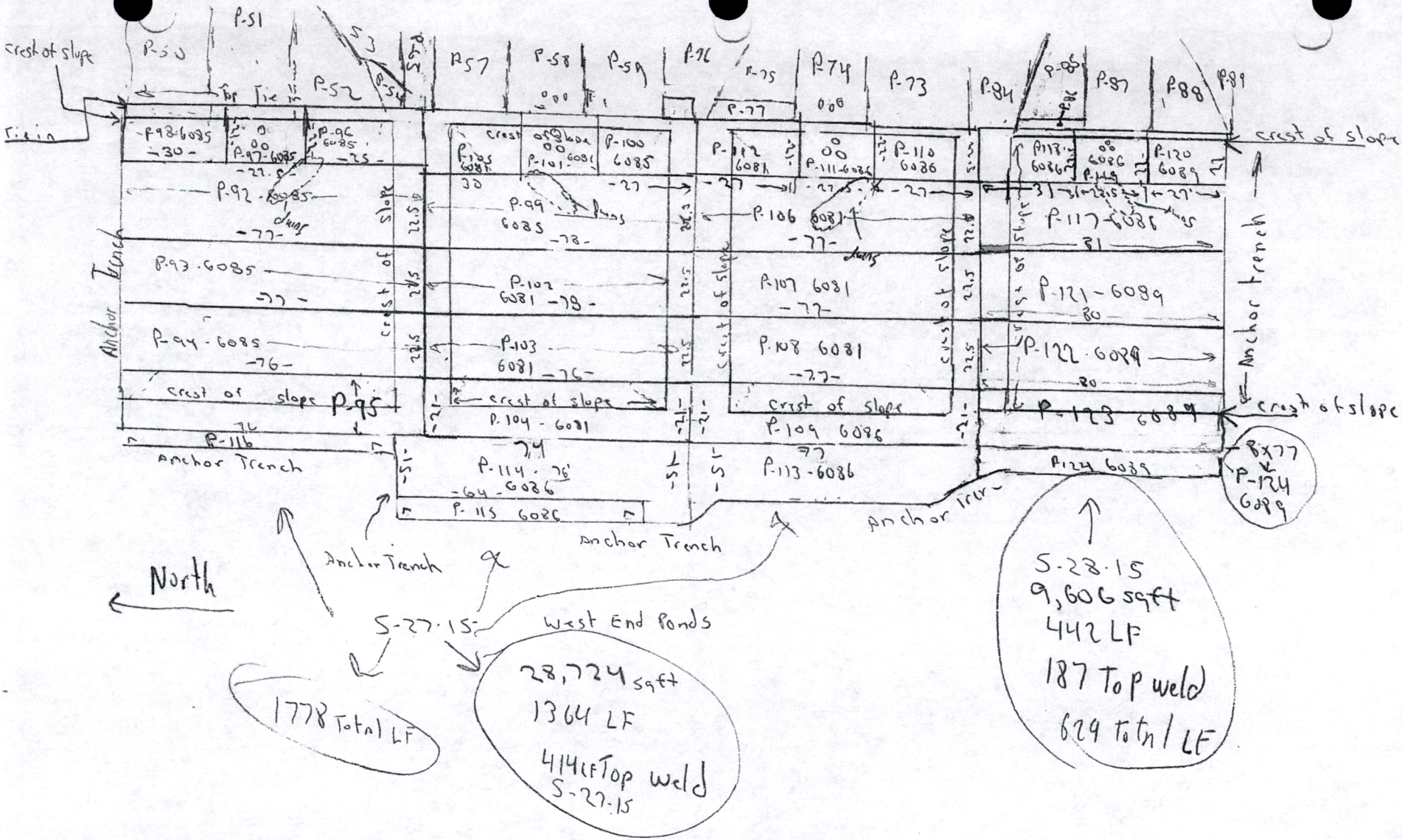
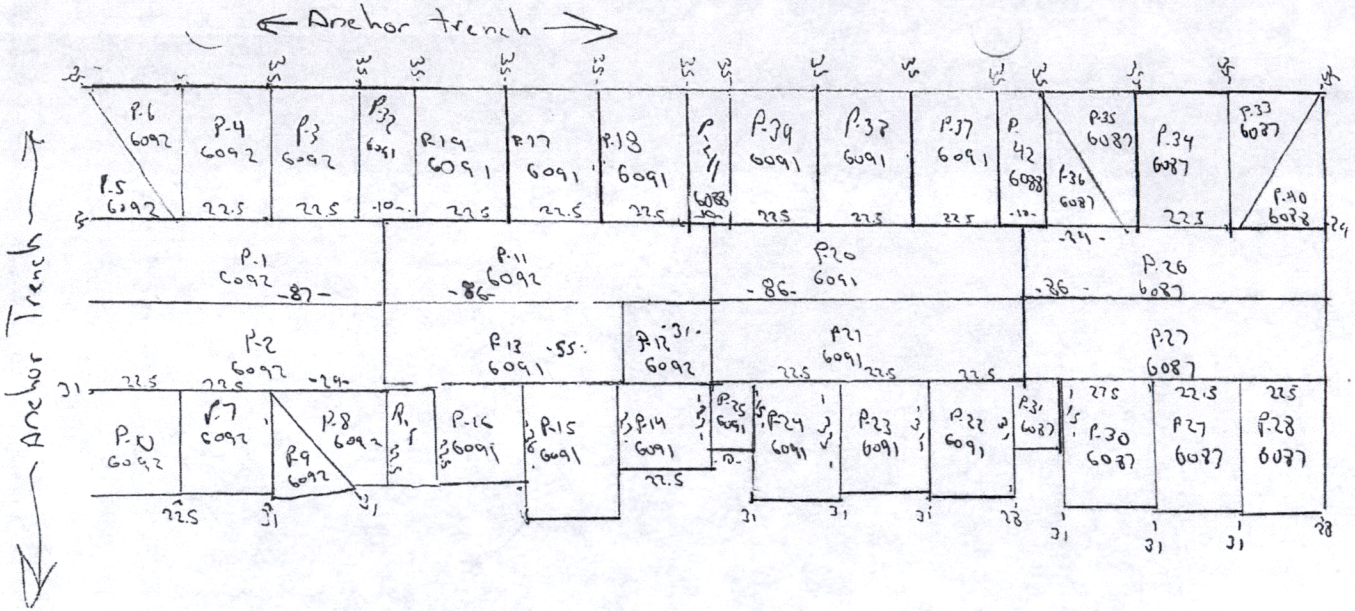
* TOS - Top of Slope
** BOS - Toe of Slope

ASBUILT

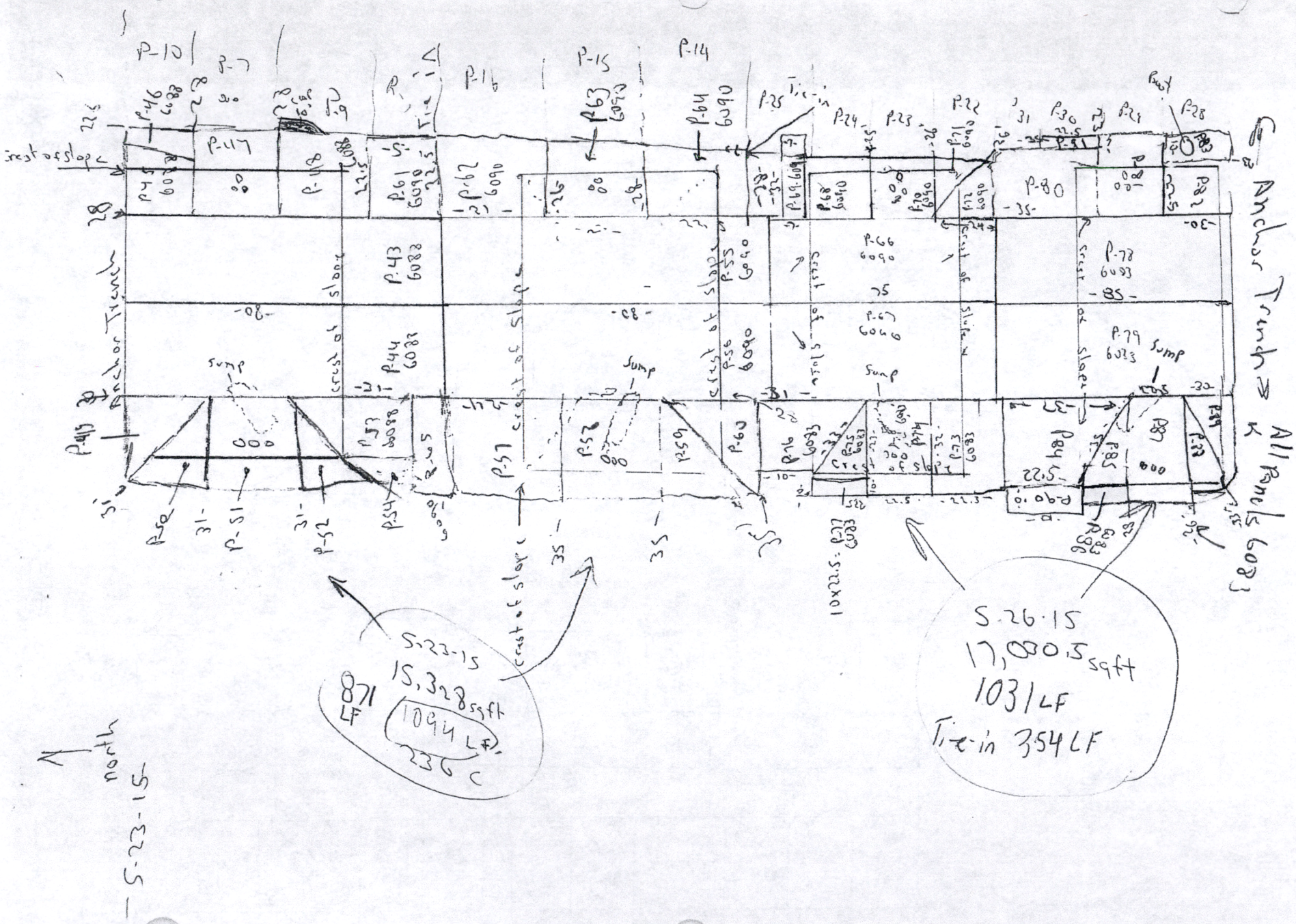
SHOP DRAWINGS


crest of slope
Tie in
Top Tie
P-50
P-51
P-52
P-53
P-54
P-57
P-58
P-59
P-76
P-75
P-74
P-73
P-84
P-85
P-86
P-87
P-88
P-89
P-98 6085
P-97 6085
P-96 6085
P-92 6085
P-93 6085
P-94 6085
P-95
P-116
P-105 6081
P-101 6081
P-100 6085
P-99 6085
P-102 6081
P-103 6081
P-104 6081
P-114 6086
P-115 6086
P-112 6081
P-111 6086
P-110 6086
P-106 6081
P-107 6081
P-108 6081
P-109 6086
P-113 6086
P-118 6086
P-119 6086
P-120 6089
P-117 6086
P-121 6089
P-122 6089
P-123 6089
P-124 6089
8x77
P-124 6089
crest of slope
Anchor Trench
Anchor Trench
Anchor Trench
Anchor Trench
Anchor Trench
Anchor Trench
North
5-27-15
West End Ponds
1778 Total LF
28,724 sqft
1364 LF
414 LF Top weld
5-27-15
5-28-15
9,606 sqft
442 LF
187 Top weld
629 Total LF

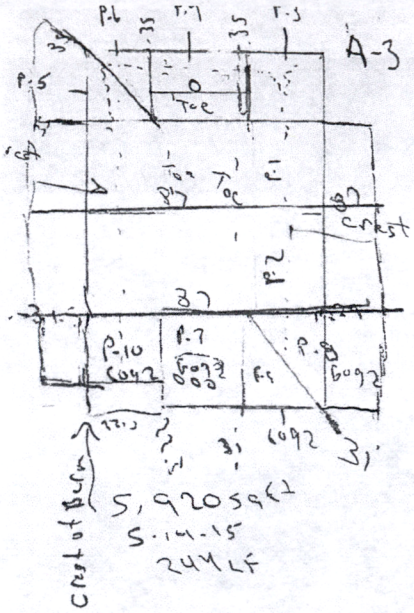


East ponds

north

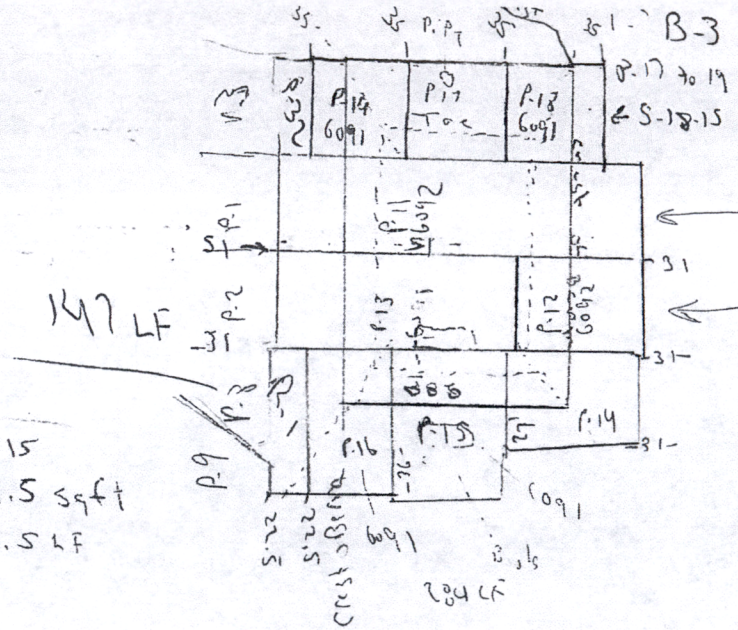


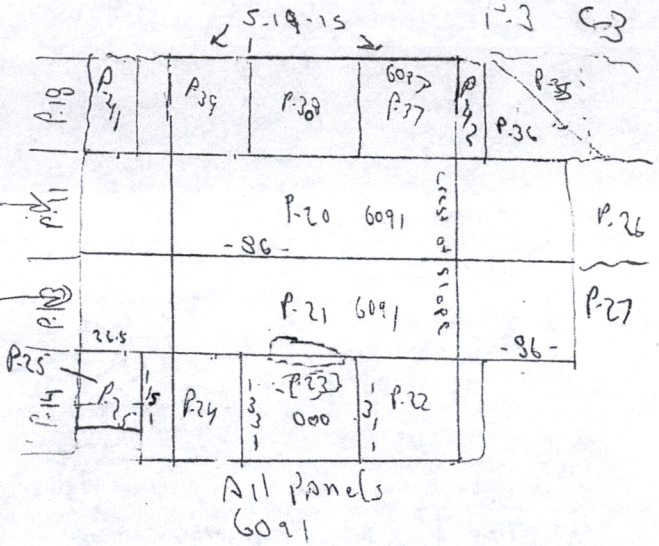
Anchor Trench
All Panels 6083
crest of slope
Sump
Tie-in
5-23-15
15,328 sqft
871 LF
1094 LF
236 C
5-26-15
17,030.5 sqft
1031 LF
Tie-in 354 LF
north
5-23-15

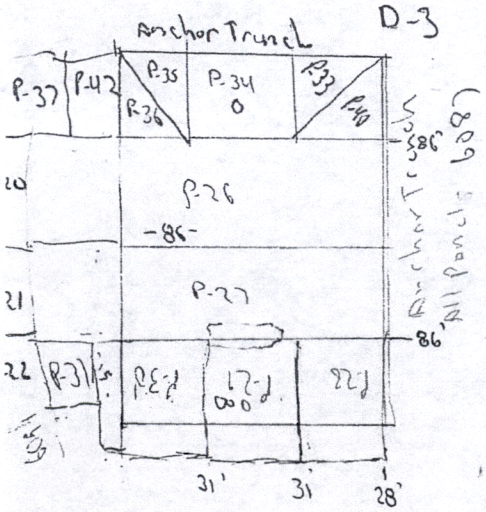


5,920 sqft
5.14.15
244 LF

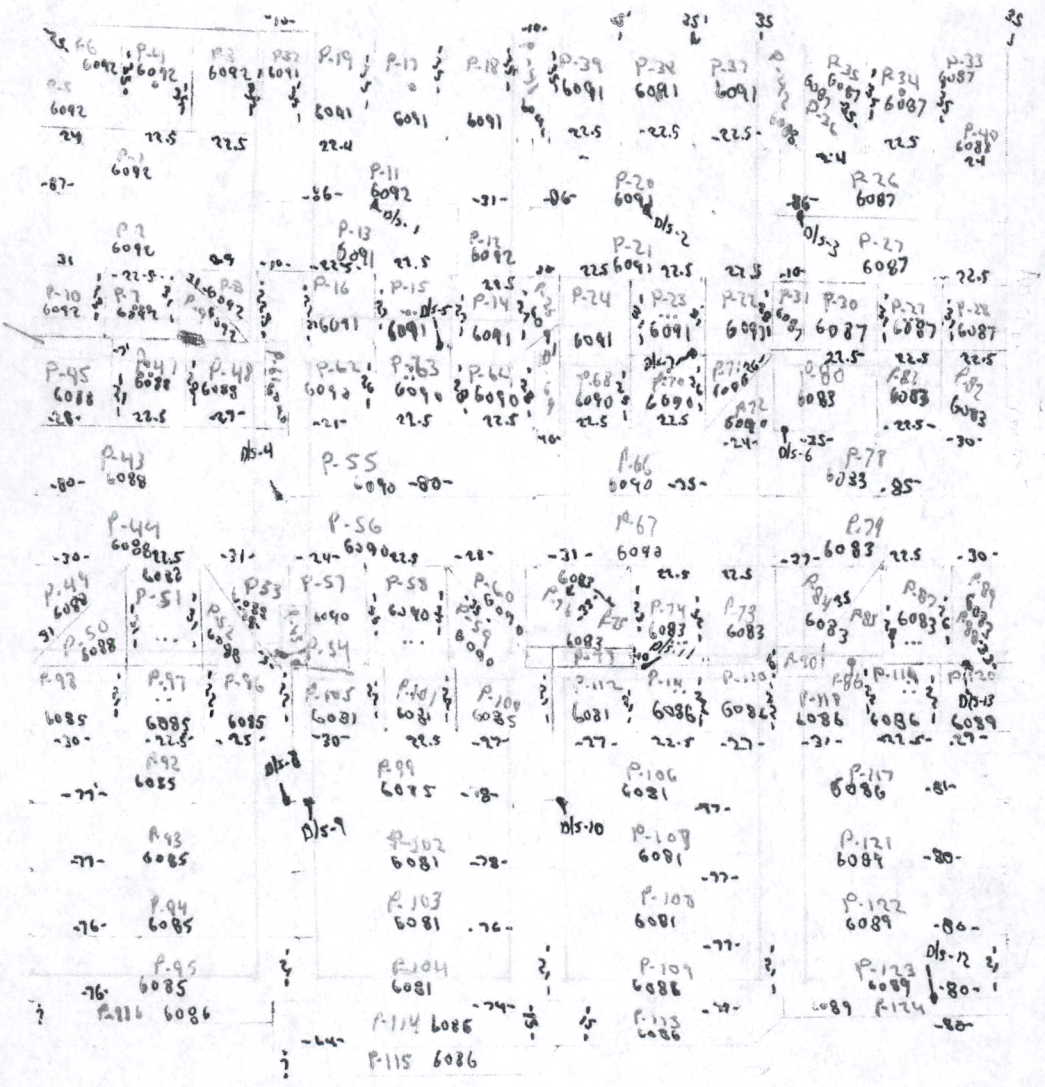
← north







338 sqft
5.18.15



Red = Panel numbers
Green: Roll numbers
Purple: Panel lengths & widths
Yellow: Crest of Berm
Blue: Bld samples

Homestake Zeolite Ponds
Grants, nm
Job # S150010

PREWELDS

SGS, INC.

Pre-Weld / [illegible]tive Sample Information

Project Name: Homestake Zeolite Ponds

Job#: S 150010

Project Manager: Tracy Larsen

Primary Secondary Other:

Superintendent: Bob Vogt

Material: 60 mil HDPE Smooth

Reported By: Kenneth Trautman

[X] Preweld Test [ ] Destructive Test

Peel Test(Extr.) min 78 ppi Peel Test(Fusion) 98 ppi Shear Test min 121 ppi

D.S. No.	Seam No.	Weld Time	Weld Date	Operator Name/ ID	Machine Number	Coupon 1 A/B	Coupon 2 A/B	Coupon 3 A/B	Coupon 4 A/B	Coupon 5 A/B	Coupon 1 Shear	Coupon 2 Shear	Results	Notes
		7:15	5/14/15	JAM	M#21	133/122	121/126	132/127	1	1	174	184	(P) F	750/7
		6:40	5/15/15	JAM	M#21	136/131	131/121	135/133	1	1	177	174	(P) F	750/7
		10:17	5/15/15	ARR	MX09	1215	1216	1218	1	1	158	149	(P) F	520/520
		6:50	5/18/15	JAM	M#21	153/141	142/135	137/131	1	1	198	181	(P) F	750/7
		2:00	5/19/15	ARR	MX09	130	129	127	1	1	189	197	(P) F	520/520
		8:30	5/19/15	JAM	M#2	133/139	127/129	131/130	1	1	180	177	(P) F	750/7
		1:03	5/19/15	JAM	M#21	131/147	141/140	129/133	1	1	193	174	P F	750/7
		1:39	5/19/15	ARR	MX09	131	132	129	1	1	169	157	(P) F	520/520
		3:10	5/19/15	JAM	MX 0	131	127	133	1	1	171	162	(P) F	485/500
		6:50	5/20/15	JAM	MX	131	122	120	1	1	174	169	(P) F	525/500
		6:53AM	5/20/15	ARR	MX0	129	133	127	1	1	167	171	(P) F	525/5
		1:00	5/20/15	JAM	MX	131	130	129	1	1	171	166	(P) F	525/500
		1:03PM	5/20/15	ARR	MX	129	132	125	1	1	165	169	(P) F	525/525
		6:30AM	5/21/15	ARR	M 9	131	129	130	1	1	180	176	(P) F	530/530
		6:45	5/21/15	JM	MX	127	131	125	1	1	177	171	(P) F	645/500
		8:25AM	5/22/15	RR		122	129	131	1	1	169	167	(P) F	530/530
		8:30	5/22/15	JM	M	121	131	123	1	1		170	(P) F	

Samples Sent Via: Last Sample #: On (Date):

Notes:

GS, INC.

Pre-Weld / tive Sample Information

Project Name: Homestead Zeolite Ponds

Job#:

Project Manager: Tracy Iverson

Primary Secondary Other:

Superintendent: Bob vogt

Material:

Reported By: Kenneth Trautman

[M] Preweld Test [ ] Destructive Test

Peel Test(Extr.) min ppi Peel Test(Fusion) ppi Shear Test min ppi

D.S. No.	Seam No.	Weld Time	Weld Date	Operator Name/ ID	Machine Number	Coupon 1 A / B	Coupon 2 A / B	Coupon 3 A / B	Coupon 4 A / B	Coupon 5 A / B	Coupon 1 Shear	Coupon 2 Shear	Results	Notes
		6:40	5/23/15	JAM	M#21	131/129	142/137	133/133	1	1	174	165	(P) F	750/7
		10:00AM	5/23/15	ARR	MX09	134	129	131	1	1	163	167	(P) F	530/530
		12:55	5/23/15	JAM	M#21	127/128	121/127	132/129	1	1	167	166	(P) F	750/7
		6:30 AM	5/26/15	JAM	M#2	129/136	131/132	71	1	1	173	177	(P) F	750/7
		11:00AM	5/26/15	ARR	MX09	1217	1218	1251	1	1	161	160	(P) F	520/520
		1:25	5/26/15	JAM	M#21	129/137	133/130	147/131	1	1	183	173	(P) F	750/7
		6:46	5/27/15	JAM	M#	124/127	127/126	125/133	1	1	177	169	(P) F	750/7
		12:50	5/27/15	JAM	M#2	123/130	131/126	122/129	1	1	167	168	(P) F	750/7
		3:28	5/27/15	ARR	MX09	129	1310	133	1	1	160	165	(P) F	530/530
		6:30	5/28/15	JAM	M#21	128/130	133/127	129/132	1	1	191	178	(P) F	750/7
		9:44	5/28/15	ARR	M#09	126	130	132	1	1	162	169	(P) F	520/520
		10:00	5/28/15	JAM	MX 0	1	129	1	1	1	167	171	(P) F	500/500
		2:50	5/28/15	JAM	MX-10	133	126	130	1	1	167	169	(P) F	500/500
		2:55	5/29/15	ARR	M 09	138	130	132	1	1	169	166	(P) F	520/520
		6:30	5/29/15	ARR		131	129	131	1	1	171	171	(P) F	530/530
		6:50	5/29/15	JAM		126	129	1	1	1	169	177	(P) F	500/500
		1:00	5/29/15	JAM	M# 0	131	121	127	1	1	167	160	(P) F	500/500

Samples Sent Via: Last Sample #: On (Date):

Notes:

SKAM CONTROL

[illegible], Inc.
[illegible]ontrol

Project Name: [illegible] Zeolite Pon
Project Manager: [illegible]
Superintendent: [illegible]
Reported By: [illegible]

Material: 60 mill Smooth HDPE
Location: Grants, NM

Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-14-15	1/2	87	8:47 am pm	JAM	02	50	7		5-20-15	At	7:30	7:35	P F	
	3/4	35	10 am pm						5-15-15		10:24	10:29	P F	
5-15-15	1/3	31	8:15 am pm								10:23		P F	
	4/6	35	7:00 am pm								9:48	9:53	P F	
	5/6	35	7:40 am pm								10:01	.06	P F	
5-14-15	5/1	35	9:50 am pm									10:07	P F	
5-15-15	7/9	31	7:56 am pm								10:47	10:52	P F	
	8/9	30	8:27 am pm								10:36	10:41	P F	
	8/2	29	8:40 am pm								10:34	10:39	P F	
	7/10	31	9:00 am pm								10:26	10:31	P F	
	2/10	31	9:12 am pm								10:19	10:24	P F	
	4/1	22.5	7:20 am pm								9:48	9:53	P F	
	11/13	51	9:43 am pm								11:00	11:05	P F	
	12/13	22.5	9:26 am pm								11:01	11:06	P F	
	12/14	31	10:03 am pm						5-19-15		2:25	2:30	P F	
	14/15	27	10:22 am pm								2:21	2:26	P F	
	15/16	36	10:33 am pm								2:05	2:10	P F	
	16/13	31	11:03 am pm								1:58	2:03	P F	
	15/13	22.5	10:40 am pm								2:06	2:11	P F	
	R-1/8	22.5	11:31 am pm								1:55	2:00	P F	
	R-1/16	22.5	11:12 am pm								1:56	2:01	P F	
	13/2	22.5	11:33 am pm								1:33	:8	P F	
	11/1	22.5	11:36 am pm								1:20	1:25	P F	
	Total =													

Air Test: 30-35 psi for 5 minutes- 3 psi loss allowed. Tested By: F.A.

SGS, Inc.
Seam Control

Pr . Name: Homestake
Project Manager: Tracy
Superintendent: Bob
Reported By:

Material: 60 mil Smooth HDPE
Location: Grants, NM
Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5 15	3/32	22	am pm								11:07	11:12	(P) F	0-22 west
			am pm										(P) F	
	19/32		8:07 am pm										(P) F	0-22 w
			am pm								11:09	11:14	(P) F	
	1/32	7	7:40 am pm									11:16	(P) F	
	11/32	7	7:41 am pm								11:12	11:17	(P) F	
	11/12	31	9:51 am pm								2:21		(P) F	
	11/18	22.5	9:45 am pm										(P) F	
	P-18	12	8:22 am pm								3:07	3:12	(P) F	
	17-18	3.5	7:24 am pm								2:53	2:58	P F	
	17/19	5	7:34 am pm										(P) F	
	11/19	28	8:50 am pm								1:31	1:36	(P) F	
	19/42	22	8:06 am pm										(P) F	0-22 w
			am pm								11:09	11:14	(P) F	22 west
	20/21	86	9:07 am pm								4:50		(P) F	0/5-2
	21/24	23	9:30 am pm								4:40	4:45	(P) F	
	24/25	20	10:08 am pm								3:35	3:40	(P) F	0 10 w
			am pm								3:34	3:39	(P) F	10w to west
	25/14	10	10:16 am pm								3:31		(P) F	
	21/12	2.5	9:55 am pm								3:17	3:22	(P) F	
	23/24	30	9:40 am pm								5:22	5:27	(P) F	
	22/23	28	9:26 am pm								5:30	5:35	(P) F	
	22/21	24	10:50 am pm						5-20-15	AF	8:05	8:10	(P) F	
	Total =													

Air Test: 30-35 psi for 5 minutes- 3 psi loss allowed. Tested By: FA

S[illegible] Control

Pr[illegible] Name: Homestake Zeolite Ponds
Project Manager: Tracy Larson
Superintendent: Bob Vogt
Reported By: Kenneth Trautman

Material: 60 mill Smooth HDPE
Location: Grants, NM

Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-18-15	22/31	22.5	11:17 am pm	JAM	021		7		5-20-15			8:35	P F	
	37/20	22.5	1:30 am pm								8:01	8:06	P F	
	P37	22	2:22 am pm									8:08	P F	k
	37/38		1:05 am pm								8:02	8:04	P F	
	38/39	36	am pm						5-19-15		5:53	5:08	P F	
	42/39	32	2:01 am pm								5:04		P F	
	30/31	22.5	12:13 am pm						5-20-15			8:42	P F	
	30 27		12 am pm								10:42	10:47	P F	0-10 south
			am pm								10:39		P F	1 south
			am pm								10:32	10:37	P F	
		29'	11:17 am pm								10:30	10:35	P F	
	28/29	24	am pm								10:29		P F	
	29/27	22.5	11:50 am pm								10:12	10:17	P F	
	27/28	34	11:40 am pm								10:10	10 5	P F	
	26/27		11:00 am pm								9:50	9:55	P F	0- [illegible]
			am pm								9:51	9:56	P F	N [illegible]
	26/36	30	11:49 am pm								9:40	9:45	P F	
	41-36	22	11:15 am pm								9:25	9:30	P F	0-10 E
			am pm								9:21	9:26	P F	10- Eeos
	41-35	15	11:13 am pm								9:19	9:24	P F	
	35-36	34	10:26 am pm								9:20	9:25	P F	
	37-41	11	11:20 am pm								9:05	9:10	P F	0-10 E
			am pm								8:50	8:55	P F	10- Eeos

Total =

Air Test: 30-35 psi for 5 minutes- 3 psi loss allowed. Tested By: FA.

...s, Inc.
Control

Project Name: Homestake Zeolite Pond
Project Manager: Tracy Larson
Superintendent: Bob Vost
Reported By: Kenneth Trautman

Material: 60 mill HDPE Smooth
Location: Grants, NM
Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-19-15	35/34	36	10:04 am pm	Jam	021	750	7		5-20-15	At	7:10	7:10	P F	
	33/34	36	10:06 am pm								7:00	7:05	P F	
	33/40	37	11:51 am pm								6:50	6:55	P F	
	26/40		11:36 am pm								6:52	6:57	P F	
	34/26	22.5	10:51 am pm								9:13	9:18	P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
	Total =													

Air Test: _____ psi for _____ minutes- _____ psi loss allowed. Tested By: _____

S[illegible], Inc.
S[illegible] Control

Project Name: Hamstrike Zeolite [illegible]
Project Manager: [illegible] Larson
Superintendent: Bob Vost
Reported By: Kenneth Trautman

Material: 60 mil HDPE Smooth
Location: Grants, NM
Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-23-15	4	23	8:06 am pm		2	50					10:56	11:01	P F	
	48/47		7:53 am pm								10:54		P F	
	45/47	24	7:20 am pm									11:04	P F	
	43/45	28	7:31 am pm								11:00	11:05	P F	
	43/47	27.5	7:29 am pm								10:55	11:00	P F	
	44/49	31	9:18 am pm								11:10	11:15	P F	
	49/50	30	9:05 am pm								11:11		P F	
	50/51	31	8:50 am pm								11:13		P F	
	51/44	22.5	9:26 am pm								11:14	4	P F	
	53/51	10	8:18 am pm								11:18		P F	
	53/44	31	am pm								11:17	11:22	P F	
	51/52	31	8:35 am pm								11:20	11:25	P F	
	52/53		8:24 am pm								11:21	11:26	P F	
	43/44	80	7:00 am pm								11:25	11:30	P F	
	5	c	8:27 am pm								11:42	11:47	P F	
	54/53	10	8:17 am pm								11:43	11:48	P F	
	55/56	0	9:43 am pm								11:26	11:31	P F	
	[illegible]		11:32 am pm								11:49	11:54	P F	
	57/65	22.5	8:36 am pm								11:50	11:55	P F	
	56/57	21	11:16 am pm								12:47	12:52	P F	
	57/58	5	11:06 am pm								12:57	12:02	P F	0-21' East
			am pm								12:59	1:04	P F	21-Eros
	59/58	35	10:39 am pm								1:09	1:14	P F	
	Total =													

Air Test: 30 psi for 5 minutes- 3 psi loss allowed. Tested By: FA

Seam Control

Project Name: [illegible]
Project Manager: [illegible]
Superintendent: [illegible]
Reported By: K[illegible] Irontron

Material: 60 mil HDPE Smooth **Job#:** S150010
Location: Grants, NM

Primary **Secondary** **Other:**

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-23-15	59/60	35	10:51 am pm	Jam		7	7		5-23-15	A+		1:15	P F	W
	58/56	22.5	11:24 am pm									1:10	P F	
	56/60		11:27 am pm									1:16	P F	
	55/64	23	10:23 am pm								1:30	1:35	P F	W- 23 north
			am pm								1:29	1:34	P F	
	63/64	28	9:58 am pm									1:36	P F	
	63/55	22.5	10:27 am pm										P F	
	62/63	26	10:05 am pm								1:37	1:42	P F	
	55/62	21	10:34 am pm								1:45	50	P F	
	62/61	22.5	11:57 am pm								2:11	2:16	P F	
	48/61	22.5	11:47 am pm								2:05	2:10	P F	
	61/55	10	11:50 am pm									2:08	P F	
	43/55	22.5	9:44 am pm								1:55	2:00	P F	
	44/56	22.5	am pm										P F	
	57/65	22.5	9:36 am pm								11:45		P F	0-10
			am pm								11:50		P F	10E to E eos
	53/65	22.5	11:32 am pm									11:44	P F	0 10 E
			am pm								11:49	11:54	P F	10 E to E eos
	45/46	22.5	2:41 am pm								2:10	2:25	P F	
	46/10	22.5	1:06 am pm								2:23	2:28	P F	
	46/7	7	1:04 am pm								2:24	2:29	P F	
	47/7	22.5	1:06 am pm						5-26-15	A+	10:47	10:52	P F	
	48/CAP	10	9:30 am pm								10:51	10:56	P F	
	Total =													

Air Test: 30-35 psi for 5 minutes- 3 psi loss allowed. Tested By: F.A

S, Inc.
Se Control

Project Name: Ho [illegible]
Project Manager: [illegible]
Superintendent: [illegible]
Reported By:

Material: 60 mill
Location: Grants, nm

Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-23-15	9/CAP	10	1:10 am pm	Jpm	021	50	7		5-26-15	At	10:53	10:58	P F	whole seam
	3	11.5	1:11 am pm								11:20	11:25	P F	
	16/62	22.5	1:13 am pm								11:23	11:28	P F	
	15/63	22.5	1:16 am pm								11:27		P F	
	15/64	4	1:19 am pm								11:33	11:38	P F	
	14/64	22.5	1:21 am pm								11:34	1:39	P F	
5-26-15	66/67	75	7:17 am pm								12:03	12:08	P F	
	68/66	23	8:26 am pm								1:35	1:40	P F	
	68/70	25	7:45 am pm								1:32	1:37	P F	
	70/66	22.5	8:31 am pm								1:33	1:38	P F	
	70/71	26	7:52 am pm								1:38	1:43	P F	
	71/72	26	8:05 am pm								2:00	2:05	P F	
	67/73	22	am pm								12:10	12:15	P F	
	73/74	32	9:27 am pm								12:21	12:26	P F	0-22 East
			am pm								12:20	12:25	P F	22E - E cos
	74/77	10	8:00 am pm								2:11	2:16	P F	[illegible] seam
	75/74	23	9:03 am pm								12:26	12:31	P F	
	75/77	22.5	8:46 am pm								2:10	2:15	P F	
	75/76	33	9:15 am pm								1:31	1:36	P F	0-23 SE Corner
			am pm								1:30	1:5	P F	23SE - SE cos
	76/67	31	9:43 am pm								12:25	12:10	P F	whole Seam
	67/74	22.5	9:47 am pm								12:11	12:16	P F	
	78/79	85	10:00 am pm								4:03	4:08	P F	
	Total =													

Air Test: 3 psi for 5 minutes- 3 psi loss allowed. Tested By: F.A

SGS, Inc.
Seam Control

Project Name:
Project Manager:
Superintendent: 3
Reported By:

Material: 60 mil HDPE Smooth **Job#:** S150010
Location: Grants

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-26-15	79/84	37	12:16 am (pm)	JAm	021		7		5-26-15	At		3:17	(P) F	[illegible]
	84/90	10	11:46 (am) pm								2:39	2:44	(P) F	
	86/90	10	11:48 (am) pm								2:40	2:45	(P) F	
	84/75	35	11:50 (am) pm								3:07	3:12	(P) F	
	86/85	22.5	11:41 (am) pm								2:41	2:46	(P) F	
	86/87	10	11:40 (am) pm								2:50	2:55	(P) F	
	85/87	28	11:34 (am) pm								3:05	0	(P) F	
	87/79	22.5	12:21 am (pm)								3:13	3:18	(P) F	
	88/87	26	11:55 (am) pm									3:39	(P) F	
	89/88	33	[illegible] am (pm)										(P) F	
	89/79	30	12:24 am (pm)								3:35	3:40	(P) F	
	88/78	35	11:16 (am) pm								3:46	3:51	(P) F	0-30
			am pm								3:42	3:47	(P) F	30s to Seas
	80/81	24	[illegible] (am) pm								3:45		(P) F	
	81/82	24	10:41 (am) pm								3:39		(P) F	
	78/82	30	11:24 (am) pm								3:38		(P) F	
	66/78	22.5	1:39 am (pm)								4:04	4:09	(P) F	
	72/80	22.5	1:35 am (pm)								4:10	4:15	(P) F	0-12 East
			am pm	JAm	021	70	7		5-26-15	At	4:50	4:55	(P) F	12E to West
	67/79	22.5	am pm	Extruded		Seam		Extrude		Extruded			(P) F	Whole Seam
	81/73	22.5	am pm	Extruded			Seam			Extruded			(P) F	Whole Seam
	69/68	32	2:25 am (pm)	JAm	021	750	7		5-26-15	At	5:57	6:02	(P) F	0-10' West
			am pm								6:00	6:05	(P) F	10' West-22' West
	Total =													

Air Test: 30 psi for 5 minutes- 3 psi loss allowed. Tested By: FA

Sea[illegible], Inc.
[illegible]ontrol

Project Name: Homestake Zeolite Ponds
Project Manager: Tracy Larson
Superintendent: Bob West
Reported By: Kenneth Trentman

Material: 60 mil HDPE Smooth
Location: Grants, NM
Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
	68/69	33	2:25 am pm		021		7		5-26-15	A+	6:00	6:05	P F	t w
	68/21		3:03 am pm								5:50	5:55	P F	Whole Seam
		22.5	3:06 am pm								5:46	5:51	P F	Top line
	71/22	20	3:09 am pm								5:33		P F	w
	80/CAP	10	3:11 am pm								5:00	5:05	P F	
	25/CAP	10	3:15 am pm								5:02	5:07	P F	
	80/91	22.5	0 am pm								5:03	5:08	P F	0-10' south
			am pm								5:08	3	P F	10s to 5eos
	91/30	22.5	3:18 am pm								5:04	5:09	P F	0-10' South
			am pm								5:07		P F	
	81/29	22.5	3:21 am pm								5:11	5:16	P F	w
	81/91	10	11:00 am pm								5:10	5	P F	
	83/81	10	10:40 am pm								5:14		P F	
	83/82	22.5	10:36 am pm								5:17	5:22	P F	
	93/28	22.5	3:28 am pm								5:19	5:24	P F	
5-22-15	92/93	77	6:51 am pm								1:55	2:00	P F	
	93/94	77	7:07 am pm								1:57	1:57	P F	
	94/95	76	7:42 am pm									3:34	P F	
5-26-15	59/76	22.5	2:36 am pm								1:16	1:21	P F	
	56/67	22.5	2:39 am pm								1:11	1:16	P F	
	55/66	22.5	2:31 am pm								1:10	1:15	P F	
5-27-15	96/97	22	8:02 am pm								4:58	5:03	P F	
	97/98	21	am pm										P F	
	Total =													

Air Test: 30-35 psi for 5 minutes- 3 psi loss allowed. Tested By: FA

SGS, Inc.
Sea[illegible]ontrol

Project Name: H[illegible] Zeo[illegible] [illegible]
Project Manager: [illegible]
Superintendent: B[illegible]
Reported By: [illegible]

Materia [illegible] **Job#:** [illegible]
Locatio [illegible]

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-27-15	98/92	3	8:32 am pm	[illegible]	C21	350	7		5-27-15	At	4:53	4:58	P F	0-17' south
			am pm								4:52	4:57	P F	17's to Seas
	97/92		8:38 am pm								4:55		P F	Wh[illegible]
	96/92	25	8:41 am pm								4:59	5:04	P F	0-7' south
			am pm								5:00		P F	
			am pm								4:19	4:24	P F	19's - Seas
	99/102	78	8:55 am pm								4:07	4:12	P F	Whale S
		78	9:16 am pm								4:05	4:10	P F	
	103/104	76	10:00 am pm								3:34	3:39	P F	
	100/107	20	11:26 am pm								5:17		P F	
	99/100	27	11:30 am pm								5:45	0	P F	0-13 south
			am pm								5:50	5:50	P F	13 n - Neos
	101/99	22.5	11:35 am pm								5:19	5:24	P F	
	105/99	28	11:41 am pm								5:17	5:22	P F	
	95/104	22.5	2:11 am pm								3:30	3:35	P F	
	103/94	22.5	2:14 am pm								3:32	3:37	P F	
	93/102	22.5	2:17 am pm								3:		P F	
	99/92	22.5	2:20 am pm								4:11	4:16	P F	
	105/96	22.5	2:23 am pm									4:20	P F	
	105/57	28	am pm								5:14	5:19	P F	
	101/58	22.5	am pm								5:16	5:21	P F	
	100/54	27	am pm								5:19	[illegible]4	P F	
	106/107	77	11:44 am pm						5-28-15		11:2[illegible]	11:[illegible]	P F	
	Total =													

Air Test: 0 psi for 5 minutes- 3 psi loss allowed. Tested By: TA

S, Inc.
Control

Project Name: A
Project Manager:
Superintendent:
Reported By:

Material: 60 mil HDPE Ponds
Location: Grants, NM
Job#: S150010

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp
5-27-15	107/108	77	11:58 am pm	Jam	021		7	
	108/109	77	11:36 am pm					
	110/111	22	12:53 am pm					
			am pm					
	111/112	21	1:10 am pm					
	106/112	27	1 am pm					
	111/106	22.5	1:20 am pm					
	110/106	27	1:17 am pm					
	104/109	22.5	1:50 am pm					
	108/103	22.5	1:50 am pm					
	107/102	22.5	1:56 am pm					
	106/99	22.5	1:59 am pm					
5-27-15	100/112	22.5	2:02 am pm					
	86/112	27	am pm					
	111/74	22.5	am pm					
	110/73	27	am pm					
5-28-15	117/121	81	7:05 am pm					
	121/122	80	7:20 am pm					
	122/123	80	8:00 am pm					
			am pm					
			am pm					
	123/124	77	7:44 am pm					
5-27-15	116/95	76	11:00 am pm					
	Total =							

Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-28-15	A1	11:18	11:23	P F	
		11:15	11:20	P F	
		11:55	12:00	P F	0-8' west
		11:53	11:58	P F	8W to W/cos
		11:51	11:56	P F	
		11:32	11:37	P F	
		1:23	1:28	P F	
		12:52	12:57	P F	
		10:53	10:58	P F	
		11:17	11:22	P F	
		11:20	11:25	P F	
		11:30	1 5	P F	
5-27-15		5:31	5:36	P F	
		5:33	5:38	P F	
5-28-15		11:50	11:55	P F	
		12:45	12:50	P F	
		1:05	1:10	P F	
		1:07	1:12	P F	
		8:08	8:13	P F	0-15 south
		2:05	2:10	P F	15-64 south
		2:06	2:11	P F	64-S cos
		1:16	1:21	P F	
5-27-15		3:45	3:50	P F	

Air Test: 30-3 psi for 5 minutes- 3 psi loss allowed. Tested By: FA.

SGS, Inc.
Sea[illegible]ontrol

Project Name: H[illegible]
Project Manager: [illegible]
Superintendent: [illegible]
Reported By: K[illegible]

Material: [illegible]
Location: [illegible]
Job#: S[illegible]

Primary Secondary Other:

Weld Date	Seam No.	Seam Length	Time	Operator Name / ID#	Mach No.	Mach Temp	Mach Speed	Amb Temp	Test Date	Test Type	Time IN	Time Out	Test Results	D. S. Number (NOTES)
5-27-15	95/114	10	8 am pm	JAM		5	7		5-27-15	HT	31	3:47	P F	Whole [illegible]
	104/114	74	10:23 am pm								47	3:52	P F	
	114/115	64	10:49 am pm						5-28-15		4:15	4:20	P F	
	113/104	10	10:40 am pm								10:54	10:59	P F	
	109/113		10:21 am pm								10:50	10:55	P F	
5-28-15	118/119	23	8:17 am pm								1:53	1:58	P F	
	120/119	22	8:23 am pm								1:50	1:55	P F	
	113/124	8	8:55 am pm								1:15	1:12	P F	
	109/123	22.5	8:56 am pm								1:11	1:16	P F	
	108/122	22.5	8:59 am pm								1:08	1:13	P F	
	107/121	22.5	9:02 am pm								1:02	1:07	P F	
	106/117	17.5	9:05 am pm								12:53	12:58	P F	
	117/110	5	9:08 am pm								1:00	1:05	P F	
	118/110	18	9:08 am pm								12:44	12:49	P F	
	86/118	31	9:12 am pm								12:46	12:51	P F	0-3' south
			am pm								12:50	12:55	P F	3's - Seas
	119/87	22.5	9:15 am pm								1:39	1:44	P F	Whole seam
	120/88	27	9:18 am pm								1:40	1:45	P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	
			am pm										P F	

Total =

Air Test: 30.35 psi for 5 minutes- 3 psi loss allowed. Tested By: FA

DESTRUCT SAMPLE INFO

SGS, INC.

Pre-Weld / Destructive Sample Information

Project Name: Homestake Zeolite Ponds

Job#: S150010

Project Manager: Tracy Larson

Primary Secondary Other: _____

Superintendent: Bob Vogt

Material: 60mil smooth HDPE

Reported By: Kenneth Trautman

[ ] Preweld Test [X] Destructive Test

Peel Test(Extr.) min 78 ppi Peel Test(Fusion) 98 ppi Shear Test min 121 ppi

D.S. No.	Seam No.	Weld Time	Weld Date	Operator Name/ ID	Machine Number	Coupon 1 A/B	Coupon 2 A/B	Coupon 3 A/B	Coupon 4 A/B	Coupon 5 A/B	Coupon 1 Shear	Coupon 2 Shear	Results	Notes
1	11/13	9:43	5-15-15	JAM	#021	161/126	143/127	139/146	125/124	144/134	—	—	(P) F	Peel 750/7
						180/	177/	176/	167/	178/	—	—	(P) F	Shear
2	20/21	9:07	5-18-15	JAM	#021	114/115	112/124	126/118	118/124	128/115	—	—	(P) F	Peel
						171/	170/	165/	161/	160/	—	—	(P) F	Shear
3	26/27	11:00	5-18-15	JAM	#021	130/130	129/119	117/132	120/119	121/140	—	—	(P) F	Peel
						153/	149/	145/	150/	162/	—	—	(P) F	Shear
4	41/43	7:00	5-23-15	JAM	#021	120/126	129/121	119/127	118/121	117/125	—	—	(P) F	Peel 750/7
						156/	152/	145/	157/	145/	—	—	(P) F	Shear
5	63/15	1:16	5-23-15	JAM	#021	115/117	118/113	116/124	116/118	128/125	—	—	(P) F	Peel 750/7
						143/	145/	136/	144/	149/			(P) F	Shear
6	78/80	11:11am	5-26-15	JAM	#021	120/146	117/136	120/123	128/119	121/126			(P) F	Peel 750/7
						164/	165/	162/	154/	170/			(P) F	Shear
7	70/73	3:06	5-26-15	JAM	#021	117/112	119/110	115/110	120/113	122/126			(P) F	Peel 750/7
						135/	130/	140/	131/	128/			(P) F	Shear
8	93/97	9:09	5-27-15	JAM	#021	115/110	117/118	120/113	124/112	120/118			(P) F	Peel
						154/	153/	139/	139/	151/			(P) F	Shear
9	102/99	8:55	5-27-15	JAM	#0 1	121/112	116/118	115/127	121/123	124/111			(P) F	Peel
						155	60	159	160				(P)	Shear

Samples Sent Via: _____ Last Sample #: _____ On (Date): _____

Notes: _____

GS, INC.

Pre-Weld / P tive Sample Information

Project Name: HOMESTAKE ZEOLITE PONDS

Job#: S150010

Project Manager: TRACY LARSON

(Primary) Secondary Other: _____

Superintendent: Robert VOLT

Material: 60 m SM

Reported By: " "

[ ] Preweld Test (X) Destructive Test

Peel Test(Extr.) min ppi Peel Test(Fusion) 98 ppi Shear Test min 120 ppi

D.S. No.	Seam No.	Weld Time	Weld Date	Operator Name/ ID	Machine Number	Coupon 1 A / B	Coupon 2 A / B	Coupon 3 A / B	Coupon 4 A / B	Coupon 5 A / B	Coupon 1 Shear	Coupon 2 Shear	Results	Notes
DS 10	P 106/105	11:44 AM	5-27-15	JAM	021	106/108	111/108	107/106	115/107	110/106			(P) F	750/7
						162/	158/	163/	158/	157/			(P) F	
DS 11	P 74/111	2:30 PM	5-27-15	JAM	021	113/121	109/112	122/127	117/110	116/117			(P) F	750/7
						133/	137/	141/	134/	146/			(P) F	
DS 12	P 123/124	7:44 PM	5-28-15	JAM	021	122/118	103/110	112/119	123/110	115/121			(P) F	750/7
						149/	159/	148/	144/	133/			(P) F	
DS 13	P 88/120	9:18 AM	5-28-15	JAM	021	113/110	120/121	119/123	116/115	115/117			(P) F	750/7
						143/	139/	144/	138/	142/			(P) F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	
						/	/	/	/	/			P F	

Samples Sent Via: _____ Last Sample #: _____ On (Date): _____

Notes: _____

DAILY PANEL PLACEMENT

Deployment Date 5-14-15

Daily Panel Placement

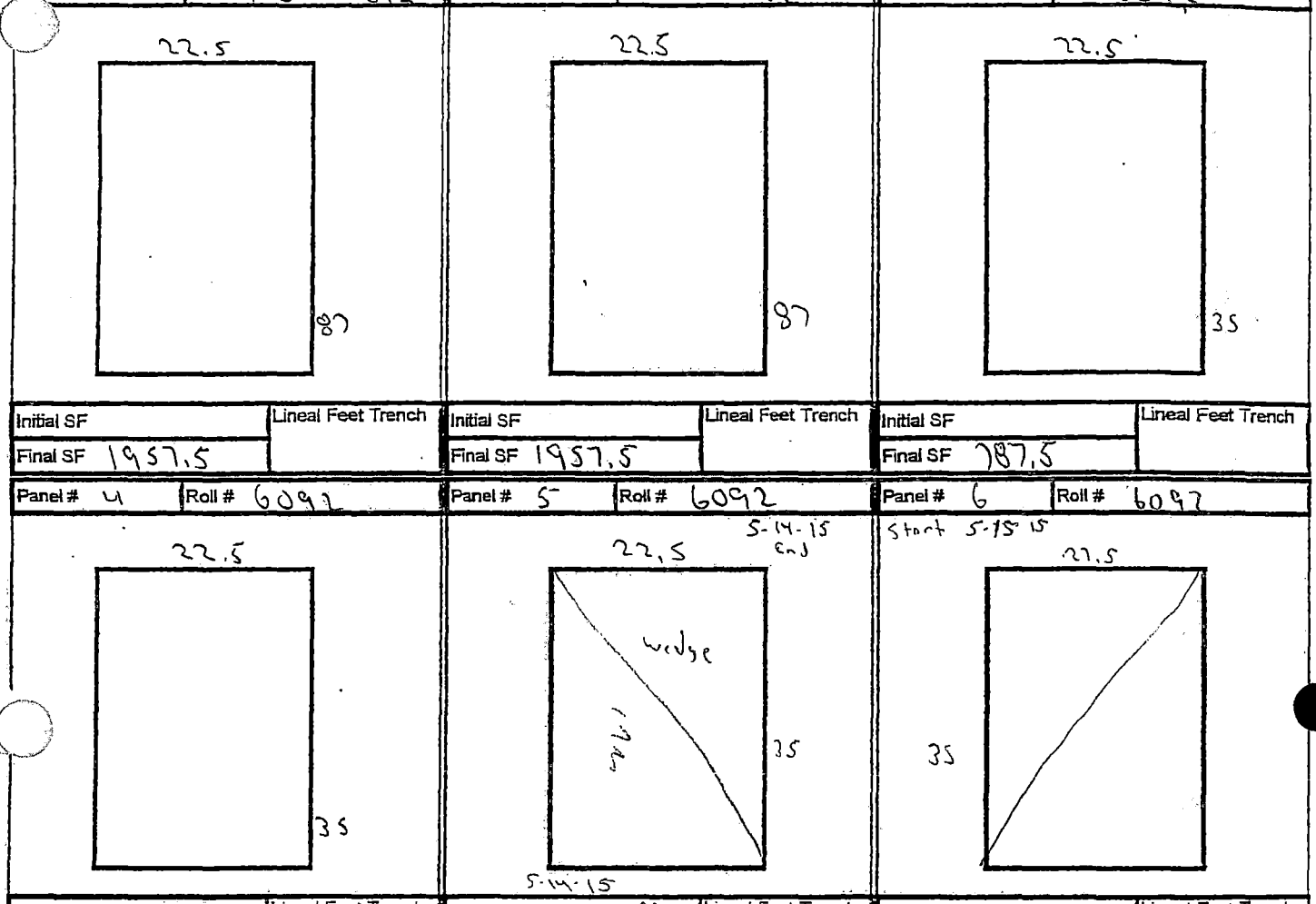
Project Name: Homestake Zeolite Ponds Job #S150010 Supt: BOB Vogt

Material: 60 mill - Smooth Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel # 1	Roll # F15B166092	Panel # 2	Roll # 6092	Panel # 3	Roll # 6092
22.5 / 87		22.5 / 87		22.5 / 35	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 1957.5		Final SF 1957.5		Final SF 787.5	

Panel # 4	Roll # 6092	Panel # 5	Roll # 6092	Panel # 6	Roll # 6092
22.5 / 35		5-14-15 End / 22.5 / wedge / 35 / 5-14-15		Start 5-15-15 / 22.5 / 35	
Initial SF	Lineal Feet Trench	Initial SF 5,920 sq ft	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 787.5		Final SF 394		Final SF 394	

Panel # 7	Roll # 6092	Panel # 8	Roll # 6092
22.5 / 31		22.5 / wedge / 29	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 697.5		Final SF 326.25	



Total Initial SF This Page ____ SF

Total Final SF This Page 7,338 SF

Anchor Trench

Total Linear feet trench ____ LF

X

Depth and width allowed in trench ____ LF

= Total SF in Trench ____ SF

Total Pay Area This Page 7,338 SF

Total Previous Pages 0 SF

Total Pay Area to Date 7,338 SF

SGS. Inc
Daily Panel Placement

Page _____ of _____

Deployment Date 5-15-15

Project Name: Homestake Zeolite Ponds Job #5150010 Supt: Bob Vogt

Material: 60 mill smooth Primary [ ] Secondary [ ] Pond # _____ Cell # _____ Pad # _____ Other: _____

Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
9	6092	22.5 × 31 (wedge)	326.25	
10	6092	End Pond #1 8,362 — 22.5 × 31	697.5	
11	6092	Start Pond 2 — 22.5 × 88	1980	
12	6092	22.5 × 31	697.5	
13	F158166091	22.5 × 57	1282.5	
14	6091	2 × 31	697.5	
15	6091	22.5 × 36	810	
16	6091	End 5-15-15 — 22.5 × 36	810	

Total Initial SF This Page	SF
Total Final SF This Page	7,301.5 SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	7,301.5 SF
Total Previous Pages	7338 SF
Total Pay Area to Date	14,639.5 SF

8,719.5 sq ft
5-15-15

Daily Panel Placement

Deployment Date 5-17-15

Project Name: Homestake Zeolite Ponds Job # S1500.10 Supt: Bob Vogt

Material: 60 mil Smooth Primary [ ] Secondary [ ] Pond # X Cell # Pad # Other:

Panel # 17	Roll # 6092	Panel # 18	Roll # 6092	Panel # 19	Roll # 6092
5-18-15					
22.5		22.5		22.5	
35		35		35	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 787.5		Final SF 787.5		Final SF 787.5	

Panel # 20	Roll # 6091	Panel # 21	Roll # 6091	Panel # 22	Roll # 6091
22.5		22.5		22.5	
86		86		31	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 1935		Final SF 1935		Final SF 697.5	

Panel # 23	Roll # 6091	Panel # 24	Roll # 6091	
22.5		22.5		
33		31		
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	
Final SF 742.5		Final SF 697.5		

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	8370 SF
Total Previous Pages	14,639.5 SF
Total Pay Area to Date	23,009.5 SF

Daily Panel Placement

Deployment Date 5-17-15

Project Name: Homestake Zeolite Ponds Job # 5150010 Supt: Bob Vogt

Material: 60 mill Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel # 25	Roll # 6091	Panel # 26	Roll # 6087	Panel # 27	Roll # 6087
22.5	15	22.5	86	22.5	86
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 337.5		Final SF 1935		Final SF 1935	

Panel # 28	Roll # 6087	Panel # 29	Roll # 6087	Panel # 30	Roll # 6087
22.5	28	22.5	31	22.5	31
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 630		Final SF 697.5		Final SF 697.5	

Panel # 31	Roll # 6087	Panel # 32	Roll # 6087
22.5	15	22.5	10
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 337.5		Final SF 225	

End 5-18-15

Total Initial SF This Page ____ SF

Total Final SF This Page ____ SF

Anchor Trench

Total Linear feet trench ____ LF

X

Depth and width allowed in trench ____ LF

= Total SF in Trench ____ SF

Total Pay Area This Page 6795 SF

Total Previous Pages 23,009.5 SF

Total Pay Area to Date 29,804.5 SF

15,389.5 Sqft
5-17-15

SGS. Inc
Daily Panel Placement

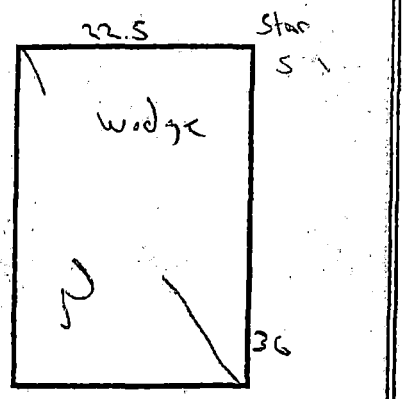
Page _____ of _____

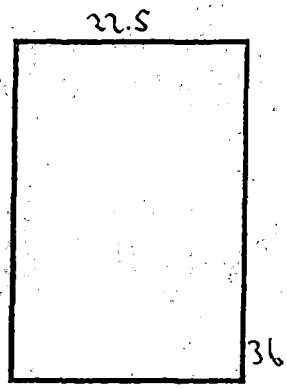
Deployment Date 8-19-15

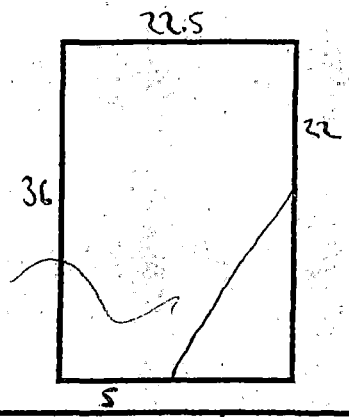
Project Name: Kenneth Troutman Job # 150010 Supt: Bob vogt

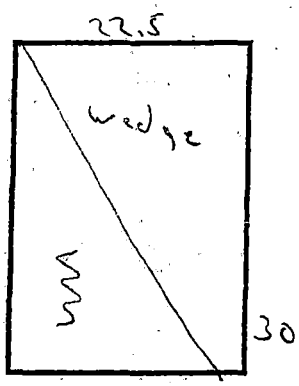
Material: _____ Primary [ ] Secondary [ ] Pond # _____ Cell # _____ Pad # _____ Other: _____

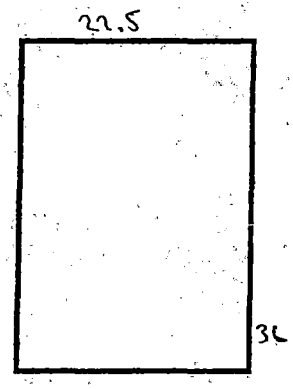
Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
P-33	6087		405	
P-34	6087		810	
P-35	6087		399	
36	6087		675	
37	6087		810	
38	6087		810	
39	6087		810	
40	6088		259	

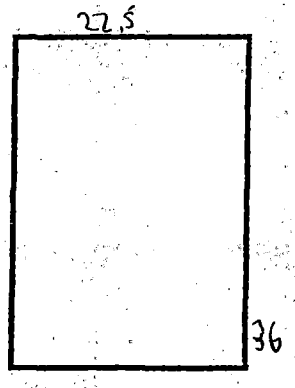


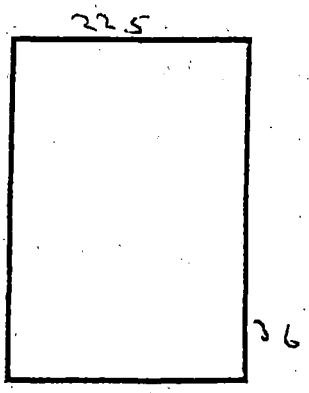


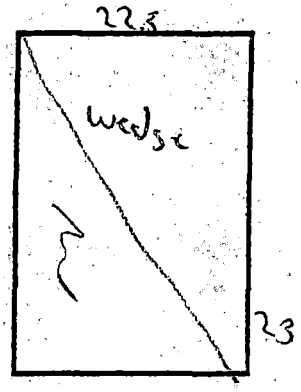












Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	4,978 SF
Total Previous Pages	29,804.5 SF
Total Pay Area to Date	34,782 SF

4,978 sq ft

SGS. Inc
Daily Panel Placement

Page _____ of _____

Deployment Date 5-19-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Voyt

Material: _____ Primary [ ] Secondary [ ] Pond # _____ Cell # _____ Pad # _____ Other: _____

Panel #	Roll #	Panel #	Roll #	Panel #	Roll #
41	6088	42	6088		
15		15	End 5-19-15		
33		33			
		4,979 sq ft			
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 495		Final SF 495		Final SF	

Panel #	Roll #	Panel #	Roll #	Panel #	Roll #
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF		Final SF		Final SF	

Panel #	Roll #	Panel #	Roll #	
				Total Initial SF This Page SF
				Total Final SF This Page SF
				Anchor Trench Total Linear feet trench LF X Depth and width allowed in trench LF = Total SF in Trench SF
				Total Pay Area This Page 990 SF
				Total Previous Pages 34,782 SF
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Total Pay Area to Date 35,772 SF
Final SF		Final SF		

Total 4 East ponds
5968 total 5-19-15

SGS. Inc
Daily Panel Placement

Page _____ of _____

Deployment Date 5-23-15

Project Name: Homestake Zeolite Ponds Job # S1500.10 Supt: Bob vogt

Material: 60 mil HDPE smooth Primary [ ] Secondary [ ] Pond # X Cell # _____ Pad # _____ Other: _____

Panel #	Roll #	Initial SF	Lineal Feet Trench	Final SF
43	6088	22.5 (start 5-23-15) × 80		1800
44	6088	22.5 × 80		1800
45	6088	22.5 × 28		630
46	6088	10 × 23		517.5
47	6088	22.5 × 28		630
48	6088	22.5 × 28		630
49	6088	22.5 wedge × 30		337.5
50	6088	22.5 × 31		349

Total Initial SF This Page _____ SF

Total Final SF This Page _____ SF

Anchor Trench

Total Linear feet trench _____ LF

X

Depth and width allowed in trench _____ LF

= Total SF in Trench _____ SF

Total Pay Area This Page 6694 SF

Total Previous Pages 35,772 SF

Total Pay Area to Date 42,466 SF

SGS. Inc
Daily Panel Placement

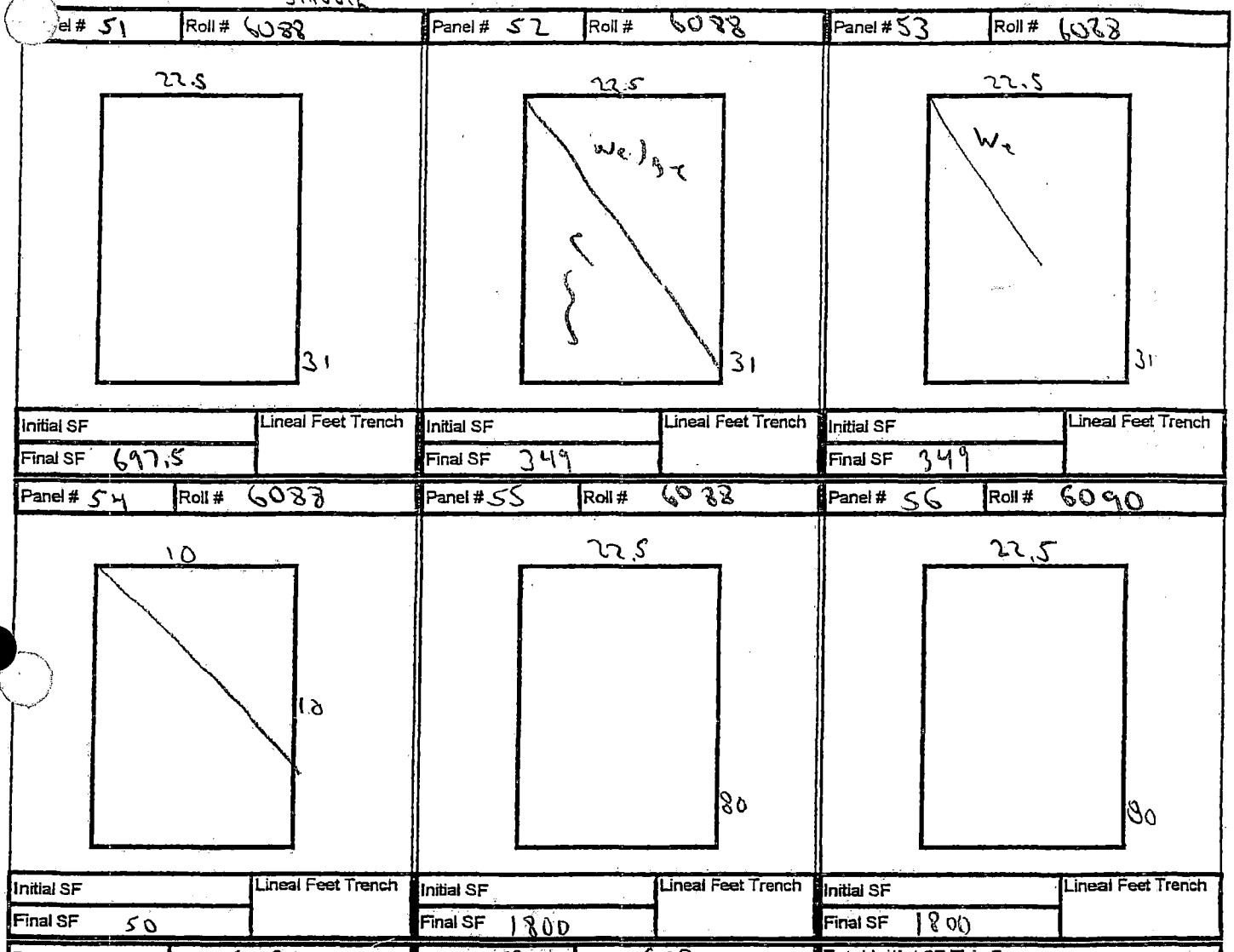
Page _____ of _____

Deployment Date 5-22-15

Project Name: Homestake Zeolite Ponds Job #150010 Supt: Bob Vigt

Material: 60 mil HDPE Primary [ ] Secondary [ ] Smooth Pond # 2 Cell # _____ Pad # _____ Other: _____

Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
51	6088		697.5	
52	6088		349	
53	6088		349	
54	6088		50	
55	6088		1800	
56	6090		1800	
57	6090		787.5	
58	6090		787.5	



Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	6620.5 SF
Total Previous Pages	42,466 SF
Total Pay Area to Date	49,086.5 SF

SGS. Inc
Daily Panel Placement

Page _____ of _____

Deployment Date 5-23-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Vogt

Material: _____ Primary [ ] Secondary [ ] Pond # _____ Cell # _____ Pad # _____ Other: _____

Panel # 59	Roll # 6090	Panel # 60	Roll # 6090	Panel # 61	Roll # 6090
22.5 wedge 35		22.5 wedge 28		.5 22.5	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 394		Final SF 315		Final SF 45	

Panel # 62	Roll # 6090	Panel # 63	Roll # 6090	Panel # 64	Roll # 6090
22.5 26		22.5 28		22.5 28	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 585		Final SF 630		Final SF 630	

Panel # 65	Roll # 6090	Panel #	Roll # 6090
CW 5 5-23-15 22.5			
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 45		Final SF	

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	2014 SF
Total Previous Pages	49 086.5 SF
Total Pay Area to Date	51,100.5 SF

15,328.5

SGS. Inc
Daily Panel Placement

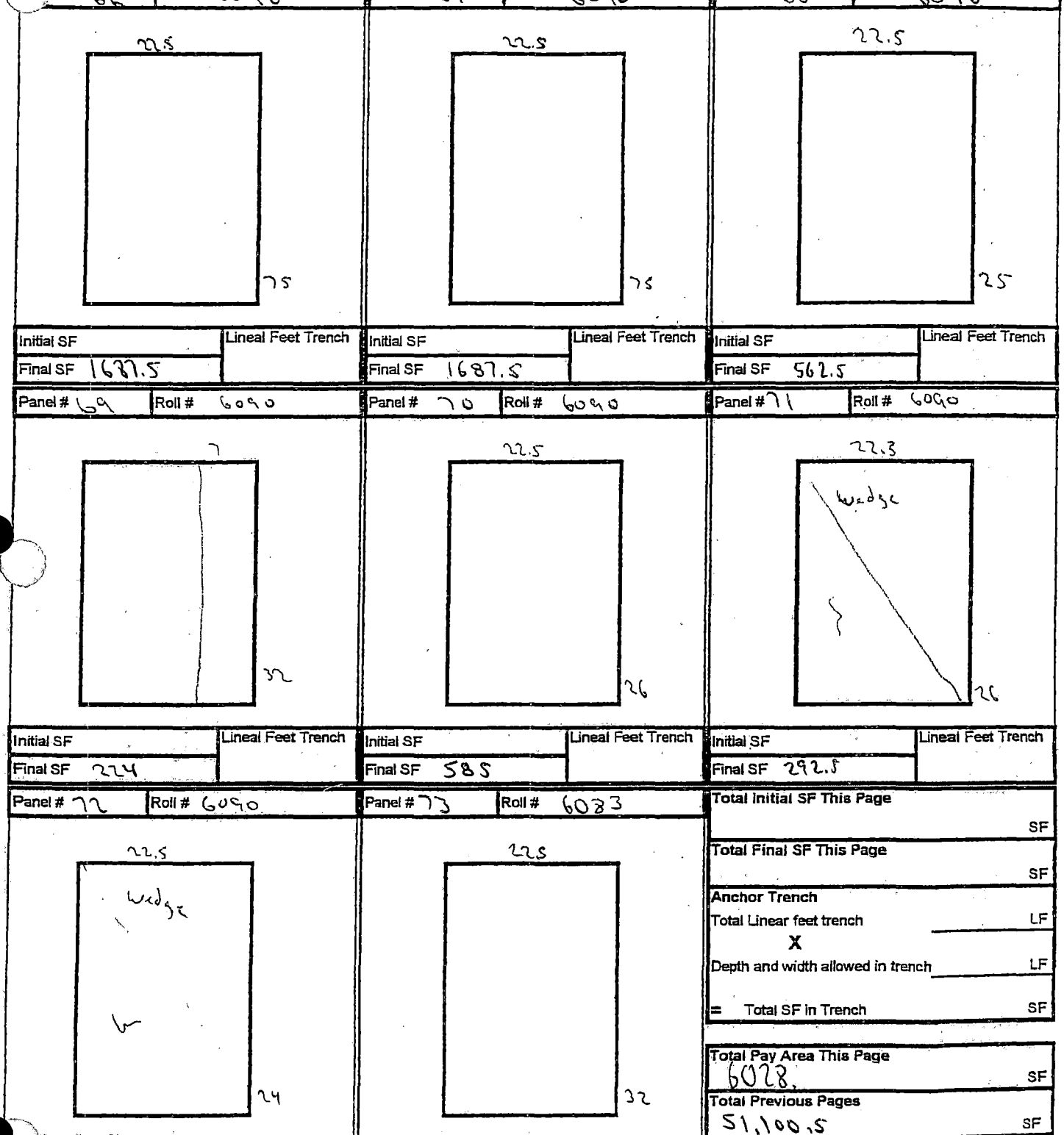
Page _____ of _____

Deployment Date 5-26-15

Project Name: Homestake Zeolite Ponds Job # 5150010 Supt: Bob Vogt

Material: 60 mil HDPE Smooth Primary [ ] Secondary [ ] Pond # _____ Cell # _____ Pad # _____ Other: _____

Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
66	6090		1687.5	
67	6090		1687.5	
68	6090		562.5	
69	6090		224	
70	6090		585	
71	6090		292.5	
72	6090		270	
73	6083		720	



Total Initial SF This Page _____ SF

Total Final SF This Page _____ SF

Anchor Trench

Total Linear feet trench _____ LF

X

Depth and width allowed in trench _____ LF

= Total SF in Trench _____ SF

Total Pay Area This Page 6028. SF

Total Previous Pages 51,100.5 SF

Total Pay Area to Date 57,129 SF

Daily Panel Placement

Deployment Date 5-26-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Vogt

Material: 60 mil Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel # 74	Roll # 6083	Panel # 75	Roll # 6083	Panel # 76	Roll # 6083
22.5 / 32		22.5 / Wedge / 23		22.5 / 10 / 31	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 720		Final SF 517.5		Final SF 461.25	

Panel # 77	Roll # 6083	Panel # 78	Roll # 6083	Panel # 79	Roll # 6083
22.5 / 10		22.5 / 85		22.5 / 85	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 225		Final SF 1912.3		Final SF 1912.5	

Panel # 80	Roll # 6083	Panel # 81	Roll # 6083
22.5 / 35		22.5 / 24	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 787.5		Final SF 540	

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	7,076.25 SF
Total Previous Pages	57,129 SF
Total Pay Area to Date	64,205.25 SF

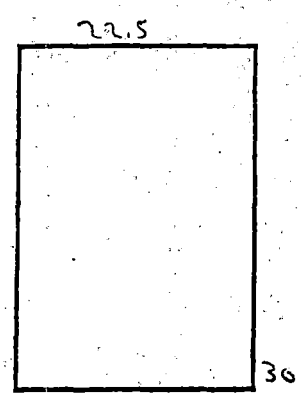
Daily Panel Placement

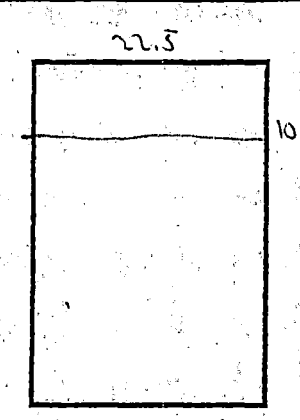
Deployment Date 5-26-15

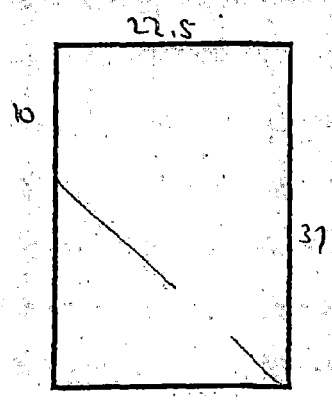
Project Name: Homestake Zeolite Ponds Job # 5150010 Supt: Bob Vogt

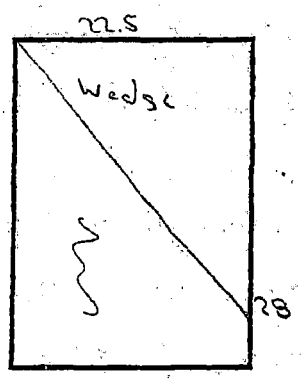
Material: 60mil HDPE Smooth Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

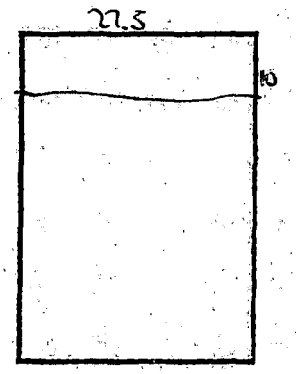
Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
82	6083		675	
83	6083		225	
84	6083		529	
85	6083		315	
86	6083		225	
87	6083		607.5	
88	6083		292.5	
89	6083		675	

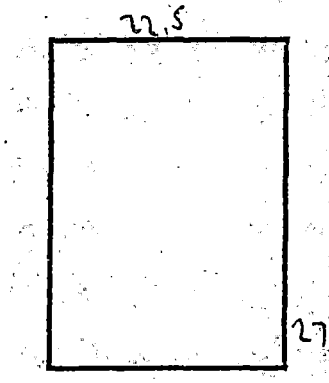


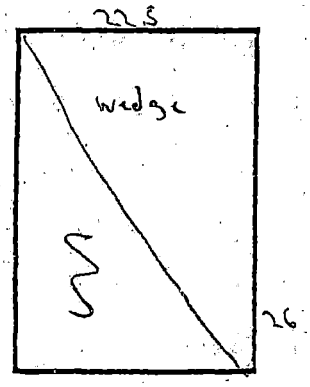


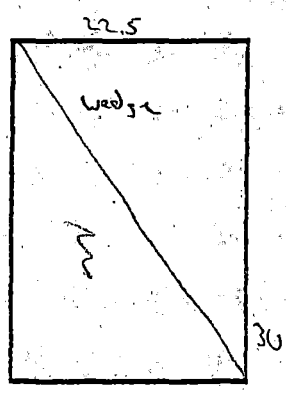












Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	3,543.5 SF
Total Previous Pages	64,205.25 SF
Total Pay Area to Date	67,749 SF

GCC, Inc

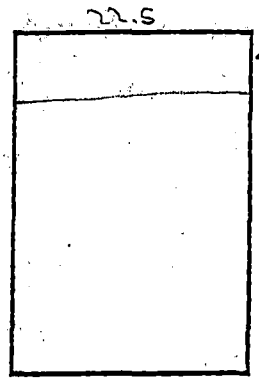
Daily Panel Placement

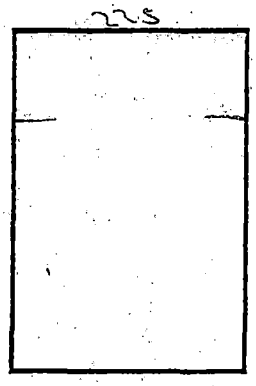
Page ____ of ____

Deployment Date 5-26-15

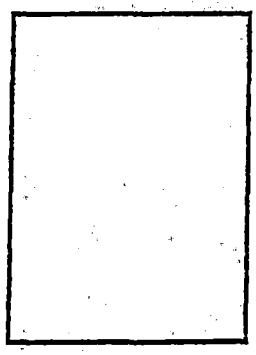
Project Name: Homestake Zeolite Ponds Job # 5150010 Supt: Bob Vogt

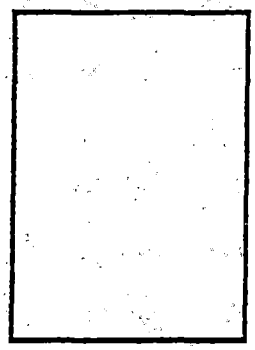
Material: 60 mill HDPE Smooth Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

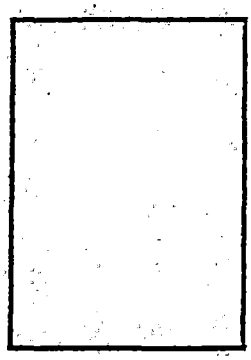




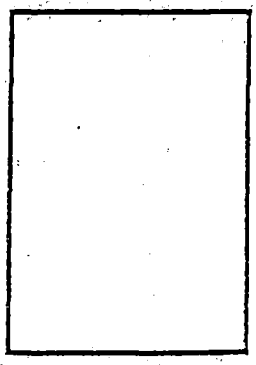
Panel # 90	Roll # 6083	Panel # 91	Roll # 6083	Panel #	Roll #
22.5	7	22.5	10		
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 157.5		Final SF 225		Final SF	

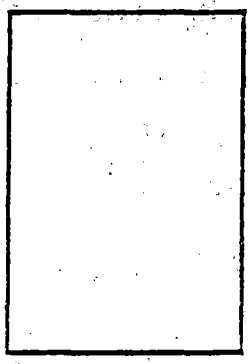






Panel #	Roll #	Panel #	Roll #	Panel #	Roll #
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF		Final SF		Final SF	





Panel #	Roll #	Panel #	Roll #
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF		Final SF	

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page 382.5	SF
Total Previous Pages 67,749	SF
Total Pay Area to Date 68,131.5	SF

17,030.5 sqft
5-26-15 Total

Daily Panel Placement

Deployment Date 5-27-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Vogt

Material: 60 mil HDPE Primary [ ] Secondary [ ] smooth Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel # 92	Roll # 6085	Panel # 93	Roll # 6085	Panel # 94	Roll # 6085
22.5 / 77		22.5 / 77		22.5 / 76	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 1732.5		Final SF 1732.5		Final SF 1710	

Panel # 95	Roll # 6085	Panel # 96	Roll # 6085	Panel # 97	Roll # 6085
21 / 76		Down slope 22 / 25 Top of Panel		22.5 / 21	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 1596		Final SF 550		Final SF 472.5	

Panel # 98	Roll # 6085	Panel # 99	Roll # 6085	
Down slope 21 / 30 Top of Panel		22.5 / 78		
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	
Final SF 630		Final SF 1755		

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	10,178 SF
Total Previous Pages	68,131.5 SF
Total Pay Area to Date	78,263 SF

Daily Panel Placement

Deployment Date 5-27-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob vogt

Material: 60 min. NDPE smooth Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
100	6085		441	
101	6081		495	
102	6081		1755	
103	6081		1755	
104	6081		1710	
105	6081		567	
106	6081		1732.5	
107	6081		1732.5	

Panel 100: 21 × 21

Panel 101: 22.5 × 22

Panel 102: 22.5 × 78

Panel 103: 22.5 × 78

Panel 104: 21 × 76

Panel 105: 21 × 27

Panel 106: 22.5 × 77

Panel 107: 22.5 × 77

Total Initial SF This Page ____ SF

Total Final SF This Page ____ SF

Anchor Trench

Total Linear feet trench ____ LF

X

Depth and width allowed in trench ____ LF

= Total SF in Trench ____ SF

Total Pay Area This Page 10,188 SF

Total Previous Pages 78,263 SF

Total Pay Area to Date 88,451 SF

Daily Panel Placement

Deployment Date 5-27-15

Project Name: Homestake Zeolite Ponds Job # _____ Supt: Bob Vogt

Material: 60 mil HDPE Primary [ ] Secondary [ ] Smooth Pond # _____ Cell # _____ Pad # _____ Other: _____

Panel #	Roll #	Initial SF	Final SF	Lineal Feet Trench
108	6081		1732.5	
109	6086		1732.5	
110	6086		594	
111	6086		472.5	
112	6081		567	
113	6086		1,155	
114	6086		1125	
115	6086		448	

Panel 108: 22.5 × 77

Panel 109: 21 × 77

Panel 110: 22 × 27 (Top of Pond) ← Slope →

Panel 111: 22.5 × 21

Panel 112: ← Slope → 21 × 27 (Top of Pond)

Panel 113: 15 × 77

Panel 114: 15 × 75

Panel 115: 7 × 64

Total Initial SF This Page _____ SF

Total Final SF This Page _____ SF

Anchor Trench

Total Linear feet trench _____ LF

X

Depth and width allowed in trench _____ LF

= Total SF in Trench _____ SF

Total Pay Area This Page 7,826.5 SF

Total Previous Pages 88,451 SF

Total Pay Area to Date 96,277.5 SF

Daily Panel Placement

Deployment Date 5-27-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Vogt

Material: 60 mil HDPE Smooth Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel #	Roll #	Panel #	Roll #	Panel #	Roll #
116	6086				
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 532		Final SF		Final SF	

Panel #	Roll #	Panel #	Roll #	Panel #	Roll #
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF		Final SF		Final SF	

Panel #	Roll #	Panel #	Roll #	
				Total Initial SF This Page ____ SF
				Total Final SF This Page ____ SF
				Anchor Trench Total Linear feet trench ____ LF X Depth and width allowed in trench ____ LF = Total SF in Trench ____ SF
				Total Pay Area This Page 532 SF
				Total Previous Pages 96,277.5 SF
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Total Pay Area to Date 96,809.5 SF
Final SF		Final SF		

Daily Panel Placement

Deployment Date 5-28-15

Project Name: Homestake Zeolite Ponds Job # S150010 Supt: Bob Vogt

Material: 60 mil HDPE Smooth Primary [ ] Secondary [ ] Pond # ____ Cell # ____ Pad # ____ Other: ____

Panel # 117	Roll # 6086	Panel # 118	Roll # 6086	Panel # 119	Roll # 6086
22.5 × 81		← Slope → 22 × 31 (Top of Panel) ← Slope →		22.5 × 22	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 1822.5		Final SF 682		Final SF 492	

Panel # 120	Roll # 6089	Panel # 121	Roll # 6089	Panel # 122	Roll # 6089
← Slope → 22 × 27 (Top of Panel) — Slope —		22.5 × 80		22.5 × 80	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 594		Final SF 1800		Final SF 1800	

Panel # 123	Roll # 6089	Panel # 124	Roll # 6089
22.5 × 80		8 × 77	
Initial SF	Lineal Feet Trench	Initial SF	Lineal Feet Trench
Final SF 1800		Final SF 616	

Total Initial SF This Page	SF
Total Final SF This Page	SF
Anchor Trench	
Total Linear feet trench	LF
X	
Depth and width allowed in trench	LF
= Total SF in Trench	SF
Total Pay Area This Page	9,606 SF
Total Previous Pages	96,277 SF
Total Pay Area to Date	105,883 SF

9,606 Total
5-28-15