

0003



# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

Norman H. Bangertter  
Governor

Dee C. Hansen  
Executive Director

Dianne R. Nielson, Ph.D.  
Division Director

355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203  
801-538-5340

August 29, 1988

TO: Alan Bachman, Assessment Conference Officer

FROM: Lynn Kunzler, Reclamation Biologist *Lynn Kunzler*

RE: NOV No. N88-17-2-1, Kaiser Coal Corporation, Wellington  
Preparation Plant, ACT/007/012, Folder #5, Carbon County, Ut.

As requested during the assessment conference for the referenced NOV on August 10, 1988, Below is a synopsis of the issues surrounding the alleged NOV.

The NOV was issued after receipt and review of the annual report. During the Review, it was noted that the vegetation test plots had not been sampled as per the approved plan, that being "a minimum of 5 1-meter square quadrats (each quadrat is considered one sample) per treatment block. Cover was to be estimated within each quadrat to the nearest 1% (one percent) by the estimator (consultant). This would result in 120 samples each (5 samples X 24 Treatment blocks) for the coarse slurry and surface facility test plots and 240 samples each (5 samples X 48 treatment blocks) for the coarse refuse and fine slurry test plots.

While the original test plot plan did not identify this method per se (stating only that the sampling methods would be the same as used to collect the baseline data from the surrounding undisturbed vegetation), the baseline report does describe the method, as well as the test plot reports submitted for the previous two years. Attachment 1 is copied from the previous years report (1986 sampling) which was given to the consultant as an example. Even this individual recognized the importance of utilizing the same sampling methodology from year to year.

The Division has approved the use of pin-frame sampling in the past where it is appropriate. However, a minimum of 50 pins (5 10-pin frames) are required for each sample. Usually this is accomplished by systematic placement (i.e. 10-pin frame placed every 5 or 10 meters along a 50 meter transect). The methods section of the 1987 report indicate this is what was utilized (Attachment 2). As you observed in on-site, treatment blocks are ca. 20 feet X 35 feet, which is impossible to place a 50 meter transect within. Therefore, if the description of sampling methodology is correct, any one sample would include data points from 3 to six different treatment blocks, thus making it impossible to determine treatment effects.

Analysis of the field data sheets indicate that data was not always collected as described in the methods section. On the surface facilities plot, one 10-pin frame was placed within each treatment block. Even if the Division would have accepted a change in sampling methods, a minimum of 25 10-pin frames would have been required. The data summary shows only 7 of the 24 blocks to have any shrubs. This test plot is the first one visited on August 10 that had an abundance of well established shrubs throughout the test plot. Attachment 3 is a copy of the field data sheets and the summary for the surface facility test plot.

The coarse refuse test plot was sampled, as described on page 38 (Attachment 4) with only 6 transects (as noted above 240 samples were needed). Attachment 5, the field data sheet indicates only one 10-pin frame (or 10 single pins) per sample. On the bottom of this sheet, the consultant has indicated the approximate location of transects. To illustrate how these transects have overlapped treatment blocks as well as failed to provide data from all treatment blocks, I have super-imposed these transects on a map of the testplots showing the individual treatment blocks (Attachment 6). Attachment 7 is the data summary which shows no desirable vegetation for this area (I have no idea how the six samples were summarized into 4 treatments). As you will recall, this is the second plot we visited where several treatments had a fair establishment of desirable grasses.

These same types of problems exist for the fine slurry test plot and coarse slurry test plot with one additional problem, The consultant combined these two test plots and considered them as treatments, rather than separate test plots (Attachment 8).

Alan, Regardless of sample methods used (the importance of using the same method is referenced in Attachment 1), the above examples demonstrate that the 1987 vegetation sampling did not sample all treatments, combined treatments within samples, test plots were combined as treatments rather than sampled separately, and/or did not meet the required number of samples (ranging from 6 samples where 240 were required to 24 samples where 120 were required). The data summaries do not accurately reflect the condition of the test plots as per the amount of shrubs or desirable vegetation. It was for these reasons that NOV # N88-17-2-1 was issued for failure to conduct vegetation monitoring in accordance with the approved plan.

Please don't hesitate to call or stop by if you need additional clarification on these matters to finalize the assessment.

cc: J. Helfrich  
NOV File  
1418R/25-26

## PERMANENT RECLAMATION

No permanent reclamation has been attempted on the Wellington Coal Cleaning Plant permit area. At this time, the Plant is under Temporary Cessation, and no plans exist to initiate final reclamation.

## RECLAMATION TEST PLOT RESULTS

### BACKGROUND

As a permit stipulation, the Division of Oil, Gas and Mining required that US Steel construct test plots in order to determine reclamation methodologies for the Wellington Coal Cleaning Plant near Wellington, Utah. Four test plots were designed to test reclamation procedures for the four major types of disturbance on the property: (1) the Surface Facilities; (2) Coarse Refuse Pile; (3) Coarse Slurry Material; and (4) Fine Slurry Material. One of the primary variables to be tested was whether or not supplemental irrigation would be required in order to achieve successful reclamation on the disturbed areas. The original plot designs and treatment variables are described in the US Steel permit. However, some of the plot designs, seeding mixtures, and treatment replications were altered at the time of plot construction. Attachments 8, 9, 10, and 11 present the as implemented seeding mixtures for the test plots.

The Surface Facilities test plot was constructed in the fall of 1984; first year's data were collected in 1985 and submitted in early 1986. The remaining three test plots were constructed by US Steel in 1985; first year's data were collected in 1986. Thus, this report contains the second year's data for the Surface Facility test plot, and the first year's data for the other three test plots.

### METHODOLOGY

Within each test plot, a number of treatments were designed in order to test various reclamation procedures. Both the number of treatments and the type of treatment vary among test plots. Attachments 12, 13, 14, and 15 identify the treatments tested, the number of replications per treatment, and the number of samples taken for that treatment. It should be noted that while standard research procedures generally require three replications per treatment, several of the treatments on the Coarse Refuse Test Plot have a varied number of replications, ranging from 1 to 5 replications per treatment. While it is believed that the number of replications was intended to be three, apparent indications from the original US Steel plot designs show that the actual number of replications implemented varied.

Each replication or subplot was sequentially numbered, and five 1 m<sup>2</sup> quadrats

per subplot were sampled for vegetative cover. Actual vegetative cover was estimated; cover classes were not utilized. This methodology was selected because it was utilized to obtain the first year's data for the Surface Facilities test plot. It should be noted that this is a subjective method for obtaining cover estimates, and while the data collected are relatively precise within a given year, they may not be accurately comparable between years due to observer bias. Utilizing the same methodology, however yields a more comparable cover parameter estimate than by utilizing a different sampling methodology.

Density estimates were not obtained since very few shrubs are present on any of the test plots.

### IRRIGATION

All test plots were irrigated 16 hours per week from approximately June 1, through July 15, 1986. In early June, irrigation was temporarily suspended for approximately 10 days as a result of 30 feet of main pump line being removed from the property by an unknown party. Irrigation was discontinued in mid-July because both the pump house and the pump were again vandalized. The pump was not repaired until September because of parts supply difficulties.

The Coarse Slurry and Fine Slurry test plots were irrigated simultaneously each Monday and Wednesday during the irrigation period for 8 hours per day. Both the Surface Facilities and the Coarse Refuse test plot were irrigated for 8 hours on Tuesday and Thursday during the irrigation period. A single pump, on a timer, provided water directly from the Price River. The valves to direct water flow from one side of the river to the other were manually set each day. No pan tests were conducted.

### RESULTS

Results of the sampling and data analysis are presented for each plot and treatment in Attachments 16, 17, 18, and 19. These analyses present the vegetative cover for each species sampled, and for rock, litter, and bare ground. The standard deviation is also presented, as is the constancy for each species. Constancy was defined as the number of quadrats in which a species occurred, calculated as a percentage of the number of possible quadrats.

VEGETATIVE MONITORING REPORT  
WELLINGTON PREPARATION PLANT

SCOPE:

Kaiser Coal Company maintains 3 properties located over a number of locations in Carbon County in Southeastern, Utah [see Figure 1, Location Map]. Two of the properties have vegetation test plots and all three properties have had either interim or permanent reclamation over small isolated areas. This report deals with the success of the vegetation establishment on each site. An attempt was made to establish parameters of evaluation and identify potential problems so that corrective measures can be implemented where necessary.

METHODOLOGIES:

Two types of surveys were conducted depending on the year that reclamation was implemented and the monitoring schedule committed to in the respective MRP's. The two methods are: [1] Reconnaissance, and, [2] Quantitative Sampling. A description of each is as follows:

- [1] Reconnaissance: Each reclamation site was surveyed and a complete ground survey was conducted. Qualitative observations were recorded. A species list was generated for the entire area. If the site encompassed more than one biom or major vegetative category, separate species lists were assembled by area. All species were noted, desirable as well as undesirable, which may

have been introduced either from adjacent areas or imported on to the site through the use of hay, straw or contaminated seed. A site specific map scaled at no greater than [1" = 50'] was utilized and all evidence of potential problems such as erosion, bare areas etc. were noted and located on the map. The use by domestic stock or wildlife was noted and categorized as to impacts and specific species which were utilized. A count of woody species [seedlings and saplings] was made and estimates of survival were recorded. A few random transects utilizing a 10 point frame were run to give tentative quantitative estimates of % cover as well as ocular estimates of species diversification.

The goal or objective of the reconnaissance survey is to identify potential problems early so that corrective actions can be expeditiously implemented.

- [2] Quantitative Sampling: Quantitative sampling of vegetation involved point samples along 50 meter transects. A random numbers table was used to determine the number of paces between transect lines. The direction of each transect was randomly selected by a hand-held compass. Compass headings that fell within the plot boundary and did not bisect other transects were used. Ten point samples were taken every 5 meters along each transect using a modified point frame. Recordings included plant species and vigor, litter, rock and bare ground. A species list and cover by species was thus generated.

Table TP-1-1  
PERCENT COVER

Plot #	Bare	Litter	Rock	Forb	Shrub	Veg. Cover	Estimate	Per Acre
1	50%	20%	0	30%	0	30%	35%	0
2	60%	30%	0	10%	0	10%	25%	0
3	50%	10%	0	40%	0	40%	30%	0
4	40%	20%	0	40%	0	40%	30%	0
5	60%	20%	0	20%	0	20%	30%	0
6	50%	20%	0	30%	0	30%	35%	0
7	80%	0	0	20%	0	20%	25%	0
8	70%	20%	0	10%	0	10%	15%	0
9	30%	40%	0	20%	10%	30%	35%	ATCA <sup>2</sup> = 129
10	80%	20%	0	0	0	0	10%	0
11	50%	50%	0	0	0	0	15%	0
12	30%	30%	0	30%	10%	40%	20%	CHNA= 129
13	30%	30%	0	10%	30%	40%	30%	ATCA=516 CHNA=129
14	30%	50%	0	10%	10%	20%	35%	ATCA <sup>2</sup> = 129
15	50%	40%	0	10%	0	10%	25%	0
16	80%	10%	10%	0	0	0	15%	0
17	50%	30%	0	0	20%	20%	20%	ATCA <sup>2</sup> = 387
18	20%	30%	0	50%	0	50%	30%	0
19	50%	20%	0	30%	0	30%	15%	0
20	100%	0	0	0	0	0	10%	0
21	30%	60%	0	10%	0	10%	20%	CHNA= 129
22	80%	0	0	10%	10%	20%	15%	ATCA <sup>2</sup> = 129
23	80%	10%	0	10%	0	10%	30%	0
24	40%	30%	0	10%	20%	30%	35%	ATCA <sup>2</sup> =129 ATCO <sup>2</sup> =129

Company Name \_\_\_\_\_ Date 7/17

Location \_\_\_\_\_ Site \_\_\_\_\_ Time \_\_\_\_\_

Magnetic Heading \_\_\_\_\_ Trajectory # \_\_\_\_\_

Species vigor and/or % cover. # indicates species  
 FACE CLT - See comments

1			HAGL	HAGL		E	F	G	F		L	B	35			
	L	E	E	E	A	B	T	L	Grass	L	L	E	25			
	V	HAGL	HAGL	3	E	S	L	T	E	E	HAGL	HAGL	B	30		
	L	V	HAGL	E	E	4	HAGL	6	E	T	E	S	L	HAGL	HAGL	30
	E	S	HAGL	E	E		L		E	B	L	B	HAGL	30		
	HAGL	V	E	E	L	S	B	T	Grass		F	E	HAGL	35		
	HAGL	V	E	E	E	B	B		E	E	E	HAGL	E	25		
	L	S	HAGL	E	E	9	E		B	E	E	B	L	E	15	
	HAGL	V	HAGL	E	E		L		E	L	L	L	L	HAGL	35	
	E	V	L	E	B	3	E	T	B	B	B	E	L	L	E	10
	E	V	E	E	L	S	L	6	E	L	L	L	L	E	15	
	E	V	L	E	E	T	L		E	HAGL	HAGL	Grass	HAGL	10		
	E	V	L	E	E	3	Grass	T	E	E	E	HAGL	L	30		
	E	V	L	E	E	7	L		E	HAGL	L	L	E	35		
	L	V	E	E	B	B		L	B	L	R	E	E	15		
	E	V	L	E	B		B		B	L	L	E	HAGL	20		
	HAGL	V	HAGL	E	E	3	HAGL	4	HAGL	6	Grass	T	L	L	10	
	L	V	L	E	E	3	E	A	B	10	Grass	B	B	HAGL	E	25
	E	V	L	E	E		B		E	E	B	E	B	10		

Comments & Observations \_\_\_\_\_

CHNA: S. White (at ERLAS) 9. Globe Nodlow SFCO

10 SAKF

Handwritten notes and signatures at the bottom of the page.



TEST PLOT #2 - [TP-2]  
COARSE REFUSE TEST PLOT

Background:

This test plot is located at the plant site [see Figure 1] approximately  $\frac{1}{2}$  mile south of the washer plant. The plot is enclosed in a 6' high fence. The actual plot is 80 feet by 210 feet, and lies on the east side of the Coarse Refuse pile. The entire plot has an average slope of 3.5' horizontal to 1' vertical. The plot is divided into two major areas: irrigated, and unirrigated with various treatments delineated in each unit as to type of refuse, soil depth, organic additives, etc. [see Plate D4-0141]. The seed mix that was utilized is included as Attachment TP2-1. The general site is identical to TP1 in precipitation and elevation. During August of 1987, a Quantitative survey was conducted. The results of that survey are summarized as Findings and Recommendations.

Findings:

The overall success of the plot is bad. Six transects were established to encounter each of the various applications. The results of those transects are included in Table TP2-1 Cover, and Table TP2-2 is a Species List. Examples of Field Notes are Attachment TP2-2.

Company Name                     

Date 7/18/82

Location                     

Site                     

Time 1:00

Magnetic Heading                     

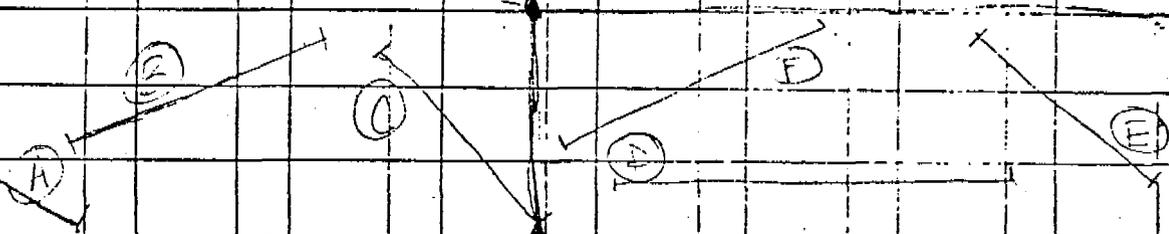
Transect #                     

Species vigor and/or % cover.

				Gumweed	False Broomrape					
	KOSP		L	L	L	E	L		L	E
				Gumweed	False Broomrape					
	KOSP	L	KOSP	E	E	L	E	E	L	L
				Gumweed	False Broomrape					
	E	KOSP	E	L	E	KOSP			KOSP	L
				Gumweed	False Broomrape					
	KOSP	KOSP	KOSP	KOSP	KOSP	KOSP	KOSP	KOSP	KOSP	KOSP
				Gumweed	False Broomrape					
	KOSP	KOSP	KOSP	KOSP	KOSP	KOSP	KOSP	KOSP	KOSP	KOSP
				Gumweed + L						
	KOSP	KOSP	L	L	L	KOSP			L	L

NOT IRRIGATED

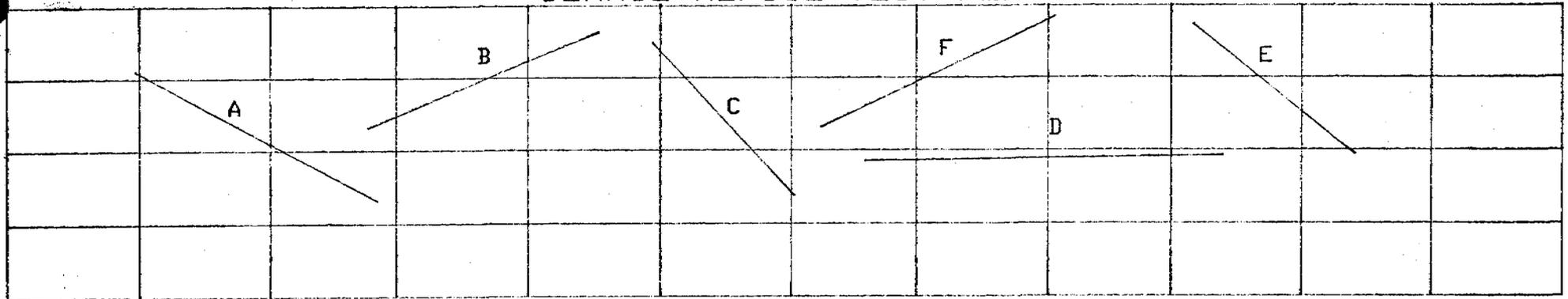
IRRIGATED



Comments & Observations

L. SWAN

WELLINGTON COAL CLEANING PLANT  
COARSE REFUSE TEST PLOT



LOCATION OF TRANSECTS A - F ARE APPROXIMATE

TABLE TP2-1  
COVER

	<u>6" Topsoil</u>	<u>12" Topsoil</u>	<u>6" Topsoil</u>	<u>12" Topsoil</u>
Desireables	∅	∅	∅	∅
<u>% Cover</u>				
Des. Veg.	∅	∅	∅	∅
Rock	∅	∅	∅	∅
Litter	10%	60%	70%	40%
Bare	∅	10%	20%	30%
Und. Veg.	90%	30%	10%	30%

TABLE TP2-2  
SPECIES LIST

Desireable Species            0%

Undesireable Species Observed:

    Kochia

    Gumweed

TEST PLOT #3 - [TP3]  
FINE AND COARSE SLURRY

Background:

These test plots are located at the same site. In order to simplify and clarify, sample data are grouped together and are referred to as [TP3] with the types of slurry; coarse or fine, dealt with as a treatment rather than two distinct test plot procedures.

The site of the plot is at the upper end of the existing slurry pond located approximately 3 miles southeast of Wellington, Utah. [See Figure 1]. The plot is enclosed in a 6' high fence. It is L shaped made up of two blocks; Coarse Slurry area is 120' x 140', the Fine Slurry area is 160' x 210'. Each of these blocks are subdivided in smaller cells measuring 20' x 35'. There are 72 cells which duplicate each of the 24 treatment 3 times. These cells are further divided to allow for each treatment to be separated as to irrigated, or non-irrigated. [See Plate D4-0141] each treatment is listed in Table TP3-1. The seed mix utilized is listed as Attachment TP3-1.

The site is relatively level; it lies at an elevation of 4900' and receives approximately 10" to 12" of precipitation annually.

The site was quantitatively surveyed during August of 1987. The results of that survey are summarized under Findings.