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Glen A. Zumwalt  
Vice President and  
General Manager

*cover letter & mod: Mine file  
cover letter & B copies: D.W. Hobbs*



**Utah Fuel  
Company**

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(801) 637-7925 or  
Salt Lake (801) 566-7111

*ACT/007/005  
#10*

Subsidiary of  
Coastal States  
Energy Company

9 May 1986

**RECEIVED**  
MAY 12 1986

DIVISION OF  
OIL, GAS & MINING

Mr. Lowell P. Braxton  
Mined Land Reclamation Administration  
DIVISION OF OIL, GAS & MINING  
355 West North Temple, Suite 350  
Salt Lake City, Utah 84180-1203

Re: Minor Modification for Subsidence Monitoring

Dear Mr. Braxton:

For the past two summers we have been doing survey work to establish the necessary ground control for the subsidence monitoring plan in the approved Skyline M&RP. Since we have been working with this subsidence plan we are finding that the plan as approved is not viable. The topography in this area is making accurate ground survey very difficult.

As we have examined this situation, we find that better monitoring data can be obtained through photogrammetric methods. The Manti-LaSal National Forest has developed a photogrammetric program for monitoring the effects of subsidence. Other mines in Central Utah are using this program in conjunction with their subsidence monitoring programs, and are finding it very useful.

We have attached fourteen copies of a proposed modification to the approved Skyline M&RP for your review. This proposed subsidence monitoring program is patterned after the monitoring program developed by the Manti-LaSal National Forest and has been reviewed with them.

If you need additional information, please contact Keith Zobell.

Sincerely,

Glen A. Zumwalt  
Vice-President/General Manager

GAZ:lm

enc

#### 4.17.5 Subsidence Monitoring Program

The Applicant has chosen to establish a subsidence monitoring program using aerial photogrammetrics patterned after a program developed by the Manti-LaSal National Forest to determine the effects of underground coal mining on surface renewable resources and surface improvements. The monitoring program shall secure adequate baseline data prior to any subsidence to quantify the existing surface renewable resources and surface improvements on and immediately adjacent to the permit area. The baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison. The monitoring program will also establish a system to locate, measure, and quantify the progressive and final affect of underground mining activities on the surface renewable resources and surface improvements. The system will utilize techniques which will provide a continuing record of change overtime and an analytical method for location and measurement of a number of points over the permitted area. The continuum of data shall incorporate and be an extension of the baseline data.

A network of control monuments consistent with the desired photogrammetric map accuracy will be established over both the permit area and the immediate adjacent areas not expected to be disturbed by subsidence. The monuments will be constructed as survey control points for monitoring the effects of subsidence on surface renewable resources and surface improvements. The monuments will be located and tied to a state plane coordinate system which is the same for both the surface and mine control surveys. This will allow the surface survey to be superimposed over the subsurface mine workings. The monuments will have the X, Y, and Z coordinates accurately measured and established by ground survey methods.

The initial aerial photography will cover the entire permit area and will be either color or black and white, flown at a scale such that elevations to within one foot vertically and horizontally ( $\pm 0.5'$ ) can be attained by photogrammetric methods. It is anticipated that the nominal or mean scale will be 1:6,000 for a 6" focal length camera, unless aerial constraints such as safety dictate flying at a higher altitude but will not exceed 1:7,200. This photography will be used for constructing the initial baseline surface map. It will also provide the master base to assist in documenting changes caused by subsidence.

To aid in the collection of additional base data on surface renewable resources, color infrared aerial photography (CIR) of the permit area may be utilized. If this technique is used, the photographs will be of the same scale as the other aerial photography.

Replaces	Text
Section 4.17, pg. 4-60, dtd 11/16/79	Section 4.17, pg. 4-60, dtd 4/2/86

Subsequent annual black and white or color photography for subsidence monitoring will cover the area mined and the area to be mined in the next 18 months (plus angle of draw). Subsequent CIR photography for monitoring surface resource trends will be flown as needed.

On all aerial photography for both the baseline data and subsequent flights, a photographic overlap of 30 percent between adjacent flight lines and an average of 60 percent overlap of photographs along the same flight line will be obtained. The baseline data will be digitized to show the undisturbed pre-subsided ground elevations and will use a grid with a nominal mean grid scale of 200 x 200 feet. The subsequent flights for subsidence will also be digitized using the same grid scale as the baseline to show the elevational deviation from the baseline elevations. The digitized information will be submitted annually to the regulatory agency after subsidence commences.

An on-the-ground visual inspection will be made annually of the ground surface of subsidence areas (including angle of draw). This inspection will attempt to locate, photograph, and document the presence of subsidence effects to surface improvements, tension cracks, fissures and other surface effects.

The subsidence monitoring data could be used to determine: 1) the critical width across the pressure arch; 2) the draw angle; 3) the ratio of observed subsidence to predicted maximum subsidence ( $S/S_{max}$ ); 4) the relationship between mining and onset of subsidence and the correspondence between the face advance and subsidence profile development; and 5) the bulking factor.

Replaces	Text
Section 4.17, pg. 4-61, dtd 9/26/80	Section 4.17, pg. 4-61, dtd 4/2/86



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*ACT/007/uc  
Folder #7*

*Mine File  
S. Jones*

Subsidiary of  
Coastal States  
Energy Company

August 1, 1986

**RECEIVED**

**AUG 06 1986**

**DIVISION OF OIL  
GAS & MINING**

Mr. Lowell P. Braxton  
Mined Land Reclamation Administration  
DIVISION OF OIL, GAS & MINING  
355 West North Temple, Suite 350  
Salt Lake City, Utah 84180-1203

Dear Lowell:

Attached is the engineers' report of activities at the Scofield Rock Waste disposal site for the second quarter of 1986.

Sincerely,

*Keith Zobell*  
Keith W. Zobell *per JS*  
Surface Foreman

KWZ:jsg

Attachments



**Coastal States  
Energy Company**

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Suite 200  
Midvale, Utah 84047  
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Subsidiary of  
The Coastal  
Corporation

July 25, 1986

I, Douglas E. Johnson, do hereby certify that during the second quarter of 1986 approximately 5,800 cubic yards of gob material was hauled to the Scofield waste rock disposal site and compacted by rolling into lifts not exceeding two feet in thickness. Several vents were covered with non-combustible material. Location of vents are shown on attached map. The site has been graded so that the material drainage will flow into the sump on the north end of the site.



*Douglas E. Johnson*

Douglas E. Johnson  
Registered Professional Engineer  
Utah Registration No. 5566

