

ARCHITECTS ENGINEERS PLANNERS/P.O. BOX 1123/SIOUX FALLS, SOUTH DAKOTA 57101

May 3, 1971 / Re: EROS Data Center  
Contract #14-08-0001-12725

Dr. W. T. Pecora  
Director  
U. S. Geological Survey  
Department of Interior  
G.S.A. Building  
18th and "F" Street, N.W.  
Washington, D. C. 20242

Dear Dr. Pecora:

We have now completed the work under Article IIA of the referenced contract and are sending herewith the following required documents in reproducible form:

1. One set of master plan drawings.
2. One copy of a detailed cost estimate for all site development work.
3. One copy of a staging plan for construction.
4. One copy of a narrative description to supplement the master plan drawings.

In addition to the above, we are also sending a copy of our suggested alternatives for water supply should this be necessary.

Please advise us if there are any questions on the enclosures.

Very truly yours,

  
Duane P. Paulson, P.E.  
Project Manager

DPP\*cas

cc: Mr. William Schmidt  
Mr. Frank Ishmael  
Mr. Glenn Landis

BLD-3  
SIOUX  
FALLS

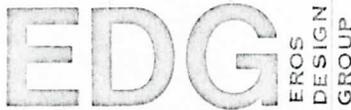




ARCHITECTS ENGINEERS PLANNERS/P.O. BOX 1123/SIOUX FALLS, SOUTH DAKOTA 57101

EROS DATA CENTER  
U.S. GEOLOGICAL SURVEY  
SIOUX FALLS, SOUTH DAKOTA  
CONSTRUCTION COST ESTIMATE  
May 3, 1971

a.	Data Center - 100,000 S.F. @ \$36.00/S.F.	\$3,600,000
b.	Maintenance Building - including space for power center	\$ 100,000
c.	Demolition	\$ 7,000
d.	Site Grading	\$ 88,000
e.	Roads (asphalt concrete) excluding future roads	\$ 128,000
f.	Parking Lots (asphalt concrete)	\$ 62,000
g.	Sidewalk	\$ 10,000
h.	Landscaping (60% of total shown on master plan)	\$ 62,000
i.	Water Supply Facilities	\$ 542,000
	1. Wells, pumps & pipeline (2 wells minimum @ 125 gpm each)	\$ 50,000
	2. Treatment plant	\$350,000
	3. Elev. Storage tank	\$110,000
	4. Distribution System	\$ 32,000
j.	Domestic Waste and Photo Wash Water Disposal	\$ 65,000
k.	Photo-Process Concentrated Waste Disposal	\$ 33,000
l.	Environmental Reservoir (lake)	\$ 35,000
m.	Storm Sewer	\$ 28,000
n.	Electrical service (main power and distribution underground, all lighting at roads and parking, service to all site systems and buildings)	<u>\$ 170,000</u>
	Total Estimated Construction Cost	\$4,930,000



ARCHITECTS ENGINEERS PLANNERS/P.O. BOX 1123/SIOUX FALLS, SOUTH DAKOTA 57101

NARRATIVE DESCRIPTION  
FOR SITE AND FACILITIES MASTER PLAN  
EROS DATA CENTER  
May 3, 1971

All existing buildings and foundations on the site, except the farm buildings at the southeast corner of the site, will be demolished. All existing live and healthy trees will remain.

Where possible, the existing topography will be unchanged. Site grading changes will primarily be required around the data handling building, waste treatment facilities and the environmental retention reservoir.

Roads will be asphalt-surfaced with concrete curb and gutters. Access roads to and over the dam will be gravel surfaced. The roadway to the site entrance will be designed for dividend two-way traffic with a one-way loop traffic pattern. Parking lots will be asphalt-surfaced and concrete curbed. Space for 450 autos is shown but expansion space is ample. Sidewalk will be concrete, five feet or wider depending on pedestrian traffic.

The landscape design concept will use native grasses and trees, all plant material intended to be hardy indigenous stock. The plantings have been located to break the wind, thus sheltering parking and pedestrian ways; visually articulate the site entrance and to screen service areas and waste storage areas. The plant material at the edges of the environmental reservoir will allow the lake elevation to fluctuate thru this material. The major portion of the site will be seeded with native grasses which are self-maintaining.

The water supply will be stored in a 250,000 gallon elevated tank. The distribution lines will supply all buildings and provide fire protection at perimeter hydrants. On-site water supply will require a lime-soda ash treatment with sludge being stored in two lagoons. Fire protection is based on the availability of 1,500 gallons per minute for three hours. Facilities for treated water will supply 150 gallons per minute at maximum hardness of 100 parts per million as  $\text{CaCO}_3$  and no iron or manganese.

The waste handling facilities provide for separate collection and treatment. The photo-process wastes are segregated into concentrated wastes and into wash water. The domestic waste and wash-water waste are to be treated in an aerated stabilization pond with tertiary treatment in an environmental retention reservoir. The retention reservoir for tertiary treatment will allow a regulated discharge of effluent to an existing dry-run receiving water course.

## Narrative Description

Page 2

The photo-process concentrated waste will be completely stored in two retention ponds. None will be discharged.

The waste handling facilities are anticipated to meet the effluent standards to be established by State and Federal regulatory agencies.

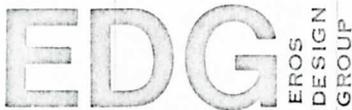
The storm sewer system will be generally limited to draining the anticipated large roof areas, parking lots and major streets.

The retention reservoir dam will be of earth construction faced with a stone rip-rap and gravel surface.

A dual power source, each loop fed, and each 12,470 volt, 3 phase direct buried in the earth will be run to the site. One utility source will be from a substation two miles west of the site and the second utility will serve from their system two miles south of the site. Direct burial lines will run to an automatic high voltage switch center in the service building. From the service building the 12,470 volt system will be in buried underground conduits to the data handling building, sewerage treatment area and future facilities. Telephone cable will be installed both off-site and on-site by the Telephone Company and will be direct burial. Initial stages of power provision will include only a one-source loop feed.

The maintenance building will provide space for the water treatment facilities, electrical power center, garage, and facilities maintenance.

The data handling building is located with ample space provided for future expansion or other related facilities.



ARCHITECTS ENGINEERS PLANNERS/P.O. BOX 1123/SIOUX FALLS, SOUTH DAKOTA 57101

EROS DATA CENTER  
Alternates for Water Supply  
May 3, 1971

During the completion of the master plan, alternate sources of water supply have been evaluated and preliminary cost estimates developed to provide a basis for comparison. The sources which were evaluated are as follows:

1. Wells on site,
2. Wells in Big Sioux River aquifer,
3. City of Sioux Falls water supply.

The possibility exists that an adequate water supply will not be readily available from wells on site. The only other ground water source for practical consideration is from the Big Sioux River aquifer approximately 5 miles west of the site. The last alternate is to purchase water from the City of Sioux Falls and construct a pipeline from the City to the site.

An evaluation and cost estimate for the above alternate sources of water supply follows:

1. Wells On Site:

Water from quartzite wells will require complete treatment for removal of probable hardness, iron and manganese. A lime-soda ash water treatment plant is proposed. The cost of chemicals for treatment is estimated to be \$0.30 per 1000 gallons.

Estimate construction costs:

Two Wells, Pumps & Pipeline	\$ 50,000.00
Treatment Plan	350,000.00
Distribution System	32,000.00
Elevated Storage Tank	110,000.00
Total	<u>\$542,000.00</u>

2. Wells In Big Sioux River Aquifer:

Water from shallow wells near the Big Sioux River will require treatment similar to that for the on-site wells, except that the cost of chemicals is estimated to be \$0.15 per 1000 gallons.

Estimated construction costs:

Wells, Pumps & Controls	\$ 25,000.00
Sites and Easements	3,000.00
Pipeline (5.5 Miles of 6" Pipe)	72,000.00
Treatment Plant	350,000.00
Distribution System	32,000.00
Elevated Storage Tank	110,000.00
Total	<u>\$592,000.00</u>

3. Water From City of Sioux Falls:

The City of Sioux Falls will sell water based on metered usage. Connection to the City system would be in the north portion of the City along U. S. Highway 77. The proposed transmission line would be installed along the right-of-way of U. S. Highway 77 and the section line road immediately south of the site. An 8-inch diameter line is proposed along U. S. Highway 77 and a 6-inch line along the section line road. An in-line booster pump would be required at the intersection of U. S. Highway 77 and the section line road. PVC plastic or other acceptable competitive pipe material is proposed.

Hardness of the treated water is normally 330 parts per million as Ca CO<sub>3</sub>. Water for photo-processing is proposed to be treated with an automatic ion exchange softener within the Data Handling Building. Approximately 250 pounds of salt would be required daily for regeneration. The City of Sioux Falls has indicated the cost of water would be in the range of \$0.40 per 1000 gallons.

Estimated construction costs:

Pipeline	
(55,000' of 8" & 24,000 of 6" Pipe)	\$235,000.00
Booster Pump & Meter	15,000.00
Ion Exchange Softener For Process Water	8,000.00
Distribution System	32,000.00
Elevated Storage Tank	110,000.00
Total	<u>\$400,000.00</u>

In this preliminary evaluation of the alternate water sources, it is evident that purchase of water from the City of Sioux Falls represents a significantly lower construction cost. In addition, the costs of operation and maintenance of the wells and treatment plant required in Alternates #1 and #2 are much greater than the cost of purchasing water and the limited treatment required for only the process water in Alternate #3.

