

**FEDERAL ENERGY REGULATORY COMMISSION**

)

**Docket No. RP07-\_\_\_\_-000**

**JAMES S. TAYLOR**

1     **Q.     Please state your name and address.**

3 Suite 400, Washington, D.C. 20005.

4 **Q. By whom are you employed and in what capacity?**

6 Williams, Moorhead & Quinn, Inc.

7     **Q.     On whose behalf are you presenting testimony in this proceeding?**

9 (“Southwest Gas Storage”).

10 **Q. Are you sponsoring any exhibits in connection with your testimony?**

12 including SGS-83. I will discuss these exhibits in the course of my testimony.

14 **experience.**

1     A.     I received a Bachelor of Science degree in Civil Engineering from Virginia  
2           Polytechnic Institute in 1970 and a Master of Science degree in Public Works  
3           Engineering from George Washington University in 1981. I have also completed  
4           four courses in depreciation sponsored by Depreciation Programs, Inc.; a course  
5           in basic petroleum engineering and a course in natural gas reservoir engineering,  
6           both sponsored by Oil and Gas Consultants International, Inc.; a course in natural  
7           gas underground storage sponsored by Continuing Engineering Education Corp.;  
8           and a course in construction cost estimating and bidding sponsored by George  
9           Mason University.

10                 From September 2003 through the present, I have been associated with  
11           Brown, Williams, Moorhead & Quinn, Inc. From March 1979 through  
12           September 2003, I was employed by the Federal Energy Regulatory Commission  
13           ("FERC" or "Commission") initially as a civil engineer and later as a regulatory  
14           gas utility specialist. My responsibilities with the Commission included  
15           conducting depreciation studies and various types of salvage analyses (including  
16           final abandonment studies) of electric, gas pipeline, and oil pipeline companies. I  
17           also conducted various types of gas transmission and underground storage cost  
18           allocation studies. Prior to my employment with the Commission, I was  
19           employed from June 1970 through February 1979 by the District of Columbia  
20           Department of Transportation as a highway engineer in the Bureau of Design,  
21           Engineering, and Research. During that period, I was engaged in highway design

1 which involved the preparation of plans, specifications, and construction cost  
2 estimates.

3 I am a registered professional engineer in the Commonwealth of Virginia  
4 and a member of the American Society of Civil Engineers. I am also a member  
5 of the Society of Depreciation Professionals.

6 **Q. Have you previously provided testimony in proceedings before the Federal**  
7 **Energy Regulatory Commission?**

8 A. Yes, I provided testimony in the following natural gas and oil pipeline rate  
9 proceedings:

10 RP83-35-000, *et al.*, Texas Eastern Transmission Corporation;  
11 RP85-37-000, High Island Offshore System;  
12 RP85-150-000, Natural Gas Pipeline Company of America;  
13 IS85-9-000, Kuparuk Transportation Company;  
14 RP87-62-000, Pacific Gas Transmission Company;  
15 RP88-120-000, Chandeaur Pipe Line Company;  
16 RP88-93-000, *et al.*, Questar Pipeline Company;  
17 RP89-58-000, Bear Creek Storage Company;  
18 RP89-86-000, Chandeaur Pipe Line Company;  
19 RP90-139-000, *et al.*, Southern Natural Gas Company;  
20 RP91-212-000, Stingray Pipeline Company;  
21 RP92-134-000, Southern Natural Gas Company;  
22 RP92-236-000, *et al.*, Williston Basin Interstate Pipeline Company;  
23 RP93-15-000, Southern Natural Gas Company;  
24 RP93-61-000, U-T Offshore System;  
25 RP93-4-000, Mississippi River Transmission Corporation;  
26 RP93-36-000, Natural Gas Pipeline Company of America;  
27 RP94-149-000, *et al.*, Pacific Gas Transmission Company;  
28 IS94-23-000, *et al.*, Gaviota Terminal Company;  
29 IS94-22-000, *et al.*, Chevron Pipe Line Company;  
30 RP94-43-000, ANR Pipeline Company;  
31 IS94-32-000, Chevron Pipe Line Company;  
32 RP95-112-000, Tennessee Gas Pipeline Company;  
33 RP95-409-000, Northwest Pipeline Corporation;  
34 IS95-35-000, Gaviota Terminal Company;

1 RP95-167-000, Sea Robin Pipeline Company;  
2 RP95-408-000, Columbia Gas Transmission Corporation;  
3 RP96-190-000, Colorado Interstate Gas Company;  
4 RP96-290-000, Michigan Gas Storage Company.  
5 RP97-373-000, Koch Gateway Pipeline Company;  
6 RP98-203-000, Northern Natural Gas Company;  
7 RP98-117-000, KN Interstate Gas Transmission Company;  
8 RP99-166-000, Stingray Pipeline Company;  
9 RP99-485-000, Kansas Pipeline Company;  
10 RP00-107-000, Williston Basin Interstate Pipeline Company;  
11 RP01-245-000, *et al.*, Transcontinental Gas Pipe Line Corporation;  
12 RP02-13-000, Portland Natural Gas Transmission System;  
13 RP03-162-000, Trailblazer Pipeline Company;  
14 RP03-221-000, High Island Offshore System, L.L.C.;  
15 RP06-417-000, Dominion Cove Point LNG, L.P.;  
16 RP06-569-000, Transcontinental Gas Pipe Line Corporation; and  
17 RP07-34-000, Southwest Gas Storage Company.

18 **Q. What is the purpose of your testimony in this proceeding?**

19 A. My testimony describes and explains my determination of the estimated final  
20 abandonment costs for the underground storage facilities owned by Southwest  
21 Gas Storage.

22 **Q. What conclusions have you reached with respect to the final abandonment**  
23 **costs of Southwest Gas Storage's underground storage facilities?**

24 A. I estimated the following final abandonment costs for Southwest Gas Storage's  
25 underground storage facilities (in 2007 dollars):

26	Howell storage field	\$ 15,360,382
27	Waverly storage field	11,412,298
28	Borchers North storage field	9,965,067
29	North Hopeton storage field	<u>2,919,644</u>
30	Total:	\$ 39,657,391

31 My final abandonment cost estimates for Howell, Waverly, Borchers North, and  
32 North Hopeton storage fields are provided individually in Exhibit Nos. SGS-80,



1 SGS-81, SGS-82, and SGS-83, respectively. I provided my final abandonment  
2 cost estimates to Southwest Gas Storage witness Mr. Edward H. Feinstein for his  
3 use in this proceeding.

4 **Q. Mr. Taylor, before you proceed any further, would you explain what is**  
5 **meant by the term “final abandonment”?**

6 A. “Final abandonment” refers to the retirement of a property at the end of its  
7 service life and is equivalent to the term “final closure.” The final abandonment  
8 of an asset may be accomplished by selling the asset in-place, abandoning the  
9 asset in-place, removing and selling the asset, removing and disposing of the  
10 asset, or removing and storing the asset in a warehouse for future reuse. There  
11 are costs associated with the retirement to ensure that the property is safely and  
12 legally removed from service. The final abandonment cost is the difference  
13 between the revenues realized from the sale or disposal of the asset (referred to as  
14 the gross salvage) and the costs associated with the retirement (referred to as the  
15 cost of removal).

16 **Final Abandonment Cost Estimate for Underground Storage Facilities**

17 **Q. Please briefly describe the underground storage facilities owned by**  
18 **Southwest Gas Storage.**

19 A. Southwest Gas Storage has a 100 percent ownership interest in the Howell,  
20 Waverly, Borchers North, and North Hopeton storage fields. Howell is a former  
21 depleted gas field located in developed portions of Livingston and Washtenaw  
22 Counties, Michigan. It has 67 injection/withdrawal (“I/W”) wells and 3

1 observation wells; approximately 38 miles of field lines; and its compressor  
2 station has 4 engines that are rated at a combined 6,000 horsepower.

3 Waverly is an aquifer storage field located in rural portions of Morgan and  
4 Sangamon Counties, Illinois. Waverly has 54 I/W wells, 33 observation wells,  
5 and 20 facility wells; approximately 14 miles of field lines; and its compressor  
6 station has 6 engines that are rated at a combined 5,550 horsepower.

7 Borchers North is a former depleted gas field located in rural Meade  
8 County, Kansas. Borchers North has 45 I/W wells and 10 observation wells;  
9 approximately 31 miles of field lines; and its compressor station has 5 engines  
10 that are rated at a combined 15,000 horsepower.

11 North Hopeton is a former depleted gas field located in rural Woods  
12 County, Oklahoma. North Hopeton has 14 I/W wells, 4 observation wells, 2  
13 disposal wells, and approximately 7 miles of field lines. Southwest Gas Storage  
14 owns a portion of the Alva compressor station which is located at the North  
15 Hopeton storage field. Panhandle Eastern Pipe Line Company, LP, an interstate  
16 pipeline affiliate, owns the remaining portion of the Alva compressor station.  
17 Southwest Gas Storage owns 3 engines at Alva compressor station that are rated  
18 at a combined 5,600 horsepower and approximately 1/3 of the Alva compressor  
19 station building and adjacent grounds.

20 **Q. Did you personally inspect typical Southwest Gas Storage facilities?**

21 A. Yes. On May 22, 2007, I inspected Borchers North and on May 23, 2007, I  
22 inspected North Hopeton. During my visit to these fields, I took numerous

1           photographs and observed the operation of typical Southwest Gas Storage  
2           facilities.

3       **Q.   Mr. Taylor, please describe how your underground storage final**  
4       **abandonment estimate is organized?**

5       A.   As mentioned above, I prepared separate final abandonment estimates for each  
6       storage field. Each final abandonment estimate consists of three sections. The  
7       first section, Storage Field Retirement, is a breakout of estimated costs by line  
8       item that will be experienced during the final abandonment of each field. The  
9       second section, Salvage, acknowledges the gross salvage value of each Southwest  
10      Gas Storage field at the time of final abandonment. The third and final section of  
11      each storage field estimate, Contingency, reflects a 10 percent contingency, that  
12      is calculated based on Section I of each estimate, to allow for miscellaneous  
13      expenses that are expected to occur but not specifically identified and included in  
14      line items in the estimate.

15      **Q.   What government regulations did you review during the development of**  
16      **your final abandonment estimate?**

17      A.   I reviewed the legal requirements to plug and abandon ("P&A") gas wells  
18      outlined in the regulations of the States of Illinois, Kansas, Michigan, and  
19      Oklahoma. I also reviewed U.S. Department of Transportation minimum safety  
20      regulations (49 CFR § 192.727) pertaining to pipeline abandonments.

1     **Q.     In addition to information obtained during your field trips and your review**  
2           **of applicable governmental regulations, what other information did you**  
3           **review during the development of your final abandonment estimate?**

4     A.     First, I familiarized myself with Southwest Gas Storage maps and schematic  
5           drawings. Second, I reviewed site plans of Southwest Gas Storage compressor  
6           stations. Third, I reviewed recent preliminary final abandonment estimates for  
7           each storage field prepared by Southwest Gas Storage. Fourth, I reviewed the  
8           well-known reference book, Cost Estimating Manual for Pipelines and Marine  
9           Structures, by John S. Page. Fifth, I reviewed the Caterpillar Performance  
10          Handbook, Edition 34, published by Caterpillar Inc. Sixth, I reviewed the Basics  
11          of Demolition Estimating, by Build Central, Inc. Seventh, I reviewed the  
12          “Architects Contractors Engineers Guide to Construction Costs” (2007 Edition)  
13          by Design and Construction Resources, and the “2007 National Heavy  
14          Construction Estimator” by Craftsman Book Company. Finally, in addition to  
15          the information listed above, I also reviewed equipment cost information  
16          published by the U.S. Army Corps of Engineers, and labor rates and construction  
17          cost information in various issues of “Engineering News Record” (“ENR”). ENR  
18          is a well-known weekly publication that focuses on the construction industry.

19     **Q.     What is the scope of work included in your final abandonment estimate?**

20     A.     The estimated scope of work will vary somewhat by field. I estimated that the  
21          work to retire the storage fields would include the following tasks:

22                 1.     Clean and purge system of hydrocarbons (all fields);

- 1                   2.     Remove field lines (all fields);
- 2                   3.     Pipe handling and storage (all fields);
- 3                   4.     Plug and abandon wells (all fields);
- 4                   5.     Remove heaters (Waverly, North Hopeton);
- 5                   6.     Restore well sites (all fields);
- 6                   7.     Grout road crossings (Howell, Waverly, Borchers North);
- 7                   8.     Remove transite siding (Howell, Waverly, North Hopeton); and
- 8                   9.     Remove compressor station (all fields).

9                   My estimated scope of work is predicated on removing all field lines from their  
10                  right-of-way ("ROW"), removing all above-ground facilities, plugging and  
11                  abandoning all wells, and conducting the final abandonment work in a safe and  
12                  environmentally sound manner consistent with all governmental regulations.

13   **Q.     What is the typical depth and diameter of wells in each storage field owned**  
14           **by Southwest Gas Storage?**

15   A.     Howell storage wells are approximately 3,900 feet in depth with 7" diameter  
16           production casing. Waverly storage wells are approximately 2,000 feet in depth  
17           with 7" diameter production casing and 2-3/8" diameter tubing. Borchers North  
18           storage wells are approximately 5,700 feet in depth with 5-1/2" diameter  
19           production casing. Finally, North Hopeton storage wells are approximately  
20           6,900 feet in depth with 5-1/2" diameter production casing and 2-7/8" diameter  
21           tubing. A typical injection/withdrawal storage well schematic is included in my  
22           final abandonment estimate for each field.

23   **Q.     Mr. Taylor, how will Southwest Gas Storage retire its wells?**

24   A.     The specific tasks necessary to P&A individual storage wells normally vary by  
25           well. All Southwest Gas Storage wells will be plugged from top to bottom with

1 cement during final abandonment operations. This approach minimizes the  
2 possibility of gas leaks should well casing corrode and lose its integrity after the  
3 well is abandoned. In wells that contain tubing, the tubing will be pulled and  
4 salvaged along with well-head equipment. After the tubing and well-head  
5 equipment are removed, the surface casing will be cut approximately four feet  
6 below the ground surface, a cement plug set, and the area backfilled.

7 **Q. What is the basis for the estimated P&A costs in your storage estimates?**

8 A. Southwest Gas Storage provided me with the estimated costs to P&A its storage  
9 wells. Southwest Gas Storage engineers reviewed and updated previous P&A  
10 estimates that included information provided by a drilling contractor. Based on  
11 these studies and other studies that I have independently conducted or reviewed, I  
12 believe Southwest Gas Storage's estimated P&A costs are reasonable.

13 **Q. Why did you include a line item for removal of field lines in your storage**  
14 **estimates?**

15 A. Southwest Gas Storage's field lines have coatings that contain asbestos. These  
16 field lines entered service during the period from the early 1960's through early  
17 1980's when coatings containing asbestos were commonplace. Because asbestos  
18 is a hazardous substance, retiring field lines in-place would subject Southwest  
19 Gas Storage and (or) its affiliates to potential liability. Removal of Southwest  
20 Gas Storage's field lines at the end of their service lives would eliminate  
21 exposure to this liability.

22 **Q. How did you develop the cost to remove field lines?**



1 road crossings where the pipe is greater than 12 inches would preclude any  
2 significant damage to the road bed should the pipe or pipe casing corrode and  
3 collapse. Limiting the grouting of road crossings to those instances where the  
4 pipe is greater than 12 inches in diameter takes into consideration instances  
5 where highway officials may allow pipe to be retired in-place without grouting.

6 **Q. Mr. Taylor, please explain the reason why you included a line item in your**  
7 **storage estimates for transite siding removal?**

8 A. Transite siding, a fire retardant material containing asbestos, is present on  
9 buildings at Howell, Waverly, and North Hopeton. Because it contains asbestos,  
10 transite siding must be carefully removed, handled, and transported to disposal  
11 sites during the demolition process. Southwest Gas Storage officials provided  
12 me with an estimated contractor cost of \$3 per square foot to remove and dispose  
13 of transite siding. I believe Southwest Gas Storage's estimated transite siding  
14 removal costs are reasonable.

15 **Q. What is the basis for your compressor station removal estimates?**

16 A. My estimates reflect the tasks, time, and equipment and labor spread necessary to  
17 remove a compressor station. First, miscellaneous material is removed to make  
18 the site ready for demolition work. Second, valves, blowdowns, meter runs and  
19 yard piping are removed. This work involves excavation, cutting, lifting, and  
20 hauling. Third, station equipment is disconnected, lifted, and stockpiled for  
21 transportation to a salvage yard by a salvage contractor. Fourth, buildings are  
22 demolished and material stockpiled for transportation by a salvage contractor.



1 Fifth, compressor blocks and concrete slabs are broken up and removed to two  
2 feet below ground surface. This work also involves excavation, cutting, lifting  
3 and hauling. Finally, the site is restored by backfilling, grading, placing top soil,  
4 seeding, and fertilizing.

5 **Q. Do your storage estimates include site restoration costs?**

6 A. Yes. Estimated site restoration costs are included in demolition contractor costs  
7 in my field line removal, well site restoration, road crossings, and compressor  
8 station estimates.

9 **Q. What labor rates did you use in your storage estimates?**

10 A. I used September 2006 union wage rates for Detroit, Michigan (Howell); St.  
11 Louis, Missouri (Waverly); and Kansas City, Missouri (Borchers North and  
12 North Hopeton), and escalated those rates to June 2007 using ENR construction  
13 cost indices. I then added a 25 percent factor for labor overhead, which consists  
14 of taxes and insurance that contractors must pay. Social security taxes, state and  
15 federal unemployment taxes, and workmen's compensation insurance are  
16 included in this cost category. I also included an adjustment factor of 1.18 for  
17 overtime pay in each labor rate. My final abandonment estimate for each storage  
18 field includes a summary of the derivation of labor rates specific to each estimate.

19 **Q. Did you include a per diem allowance in contractor labor costs in your**  
20 **storage estimates?**

21 A. Yes. I used per diem allowances of \$125 per day for Howell and Waverly and  
22 \$100 per day for Borchers North and North Hopeton. I chose these per diem

1 allowances after reviewing the United States Internal Revenue Service document:  
2 “Publication 1520 Per Diem Rates” dated March 2007. Typically, contractors  
3 must pay per diem allowances to their employees to compensate them for  
4 working in areas far from their home base.

5 **Q. What equipment rates did you use in your storage estimates?**

6 A. I used the equipment rates in the Construction Equipment Ownership and  
7 Operating Expense Schedule, for Regions II, V, and VI published by the U.S.  
8 Army Corps of Engineers, July 2005 and escalated these rates to June 2007 using  
9 ENR construction cost indices. Howell is located in Region II; Waverly and  
10 Borchers North are located in Region V; and North Hopeton is located in Region  
11 VI. Hourly equipment rates are included in this publication for contractor owned  
12 and operated equipment working in “average” or “severe” conditions. I assumed  
13 “average” operating conditions for my cost estimate, based on Appendix C of this  
14 publication entitled “Guide for Selecting Operating Conditions” and upon my  
15 knowledge of Southwest Gas Storage’s facilities. My final abandonment  
16 estimate for each storage field includes a summary of the equipment rates  
17 specific to each estimate.

18 **Q. What factors did you employ in your storage estimates to reflect the indirect**  
19 **costs incurred by pipeline demolition contractors?**

20 A. The indirect cost factors used in my estimate for pipeline demolition contractors  
21 include a 5 percent factor for mobilization, a 15 percent factor for overhead, and  
22 a 10 percent factor for profit. These indirect cost factors are based on my past

1           experience and knowledge of the construction industry. I believe they are a  
2           reasonable reflection of the indirect costs a prudent contractor and owner would  
3           expect to incur during a pipeline retirement of this scale.

4   **Q.   How did you estimate the time needed for the demolition crews to carry out**  
5   **specific demolition activities in your storage estimates?**

6   A.   I relied on my past experience and judgment gained from performing first-hand  
7           estimates as a highway engineer and developing and analyzing abandonment  
8           estimates of regulated gas pipeline, oil pipeline, and electric companies.

9   **Q.   Mr. Taylor, did you include environmental monitoring costs in your storage**  
10   **estimates?**

11   A.   Yes. Each demolition line item contains a factor based on five percent of the  
12           demolition contractor's costs to allow for the costs of monitoring each final  
13           abandonment activity, conducting tests for hazardous materials, analyzing the  
14           results, and writing reports.

15   **Q.   Similarly, did you include an allowance for Southwest Gas Storage**  
16   **inspection in your storage estimates?**

17   A.   Yes. An allowance of \$500 per day per company inspector is included in my  
18           estimates for monitoring pipeline and compressor station demolition work. An  
19           allowance of \$1000 per day per company inspector is also included for  
20           monitoring P&A work. These allowances include labor costs, per diem, and  
21           transportation costs.

1   **Q.   Did you also include an allowance for Southwest Gas Storage management**  
2       **and overhead costs in your storage estimates?**

3   A.   Yes. Each demolition line item contains a management and overhead factor  
4       based on 15 percent of the demolition contractor's cost, environmental costs, and  
5       pipeline company inspection costs to allow for the costs to manage and carryout  
6       the project. The 15 percent factor that I used for Southwest Gas Storage  
7       management and overhead is the same as the level of overhead that I used in  
8       developing demolition contractor costs in each demolition line item. The 15  
9       percent Southwest Gas Storage management and overhead factor includes the  
10      following cost items: project management, FERC abandonment application,  
11      miscellaneous permits, engineering, construction management, ROW, project  
12      security, and general and administrative overhead.

13   **Q.   Do you anticipate significant ROW costs during the storage field final**  
14       **abandonments?**

15   A.   Yes. First, ROW easement holders must be notified in writing of the final  
16       abandonment. Second, legal documents must be drafted and executed to transfer  
17       full use of the ROW back to the easement holder. Third, Southwest Gas Storage  
18       must obtain permits to work in the ROW, remove pipe from the ROW, restore  
19       well and compressor sites, and grout road crossings. ROW notification costs,  
20       legal costs, and permit costs described above are included in the 15 percent factor  
21       for storage company management and overhead costs in each line item.

1           In addition to the ROW costs listed above, the contractor's demolition  
2 activities will damage crops and ROW resulting in damage payments to affected  
3 ROW holders. Southwest Gas Storage provided me with a damage payments  
4 estimate of \$2 per foot of ROW based on its past experience. Given that Howell  
5 is located in a developed area and Waverly, Borchers North, and North Hopeton  
6 are located in agricultural land, I believe the damage payments estimate of \$2 per  
7 foot of ROW is very reasonable. Therefore, I used a ROW damage allowance of  
8 \$2 per foot during the development of my line item "Remove field lines" in each  
9 storage estimate.

10 **Q. Did you consider salvage in your storage estimates?**

11 A. Yes. I included gross salvage allowances for compressor station equipment,  
12 buildings, pipe, well tubing, well head equipment, and heaters. For compressor  
13 station equipment, I estimated that gross salvage would equal the cost to remove  
14 the equipment. I estimated that the gross salvage value of carbon steel used in  
15 buildings, well tubing, well head equipment, and heaters would be \$160 per ton  
16 at the work site, which is approximately 60 percent of the value of carbon steel  
17 scrap at the scrap yard. The reduced salvage value at the work site takes into  
18 consideration the cost to the salvage contractor of preparing the material for  
19 shipment to the scrap yard and the cost of transporting the material to the scrap  
20 yard. I estimated that the gross salvage value for field lines with coatings that  
21 contain asbestos would be \$60 per ton at the work site. This gross salvage value

1 estimate is for bent and dented pipe with asbestos containing material and was  
2 provided to me by Southwest Gas Storage.

3 **Q. Please comment on the 10 percent contingency used in your storage**  
4 **estimates.**

5 A. My use of a 10 percent contingency is appropriate. The contingency is designed  
6 to provide for miscellaneous costs that are expected to occur but not specifically  
7 identified and included in line items in the storage estimates.

8 **Q. Mr. Taylor, how would you characterize your underground storage final**  
9 **abandonment estimate?**

10 A. I believe that my underground storage final abandonment estimate is a reasonable  
11 assessment of the final abandonment costs in 2007 dollars that would be incurred  
12 to retire Southwest Gas Storage's four storage fields.

13 **Q. Does this conclude your prepared direct testimony?**

14 A. Yes, it does.

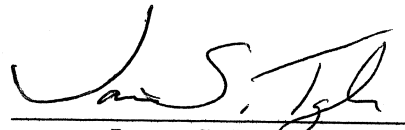
UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION

Southwest Gas Storage Company )

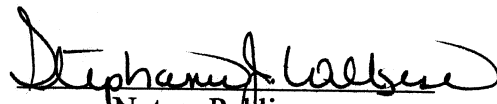
Docket No. RP07-\_\_\_\_-000

AFFIDAVIT OF  
JAMES S. TAYLOR

James S. Taylor, being first duly sworn, deposes and says that he is the James S. Taylor whose "Prepared Direct Testimony of James S. Taylor" appears on the proceeding pages; that such testimony was prepared by him; that he is familiar with the contents thereof; that the facts set forth herein are true and correct to the best of his knowledge, information, and belief; and that he does adopt the same testimony in this proceeding.

  
James S. Taylor

Subscribed and sworn before me, a Notary Public, in and for the District of Columbia, this 20<sup>th</sup> day of July, 2007.

  
Notary Public



My Commission expires: June 14, 2009

**Southwest Gas Storage Company  
Final Abandonment Estimate**

**Howell Storage Field**

(Location: Livingston and Washtenaw Counties, Michigan)

**General Assumptions**

1. Southwest Gas Storage final abandonment projects will be conducted independently.
2. Southwest Gas Storage management team will begin preparation for its Howell final abandonment two years prior to the scheduled abandonment. Southwest Gas Storage will manage and coordinate retirement activities prior to and during the actual retirement or hire a construction manager to perform these duties. Demolition work will be completed one year after work commences.
3. Southwest Gas Storage will file a FERC Section 7(b) abandonment application for the Howell abandonment project that will include a complete environmental report concerning the proposed final abandonment activities.
4. All above ground facilities will be removed and disturbed areas restored.
5. Field lines will be purged of hydrocarbons, cut in 40 foot sections, and removed.
6. All underground storage field injection/withdrawal and observation wells will be plugged and abandoned. Well head equipment will be salvaged.
7. Southwest Gas Storage will hire an environmental contractor to monitor retirement work and check for the presence of hazardous materials. Work will involve inspection, sampling, evaluation, and report writing. It is estimated that environmental contractor costs will be 5 percent of demolition contractor's costs.
8. Southwest Gas Storage inspection costs are estimated to be \$500 per day per inspector for pipeline and compressor station removal and \$1,000 per day per inspector for well P&A.
9. The estimated scrap value of carbon steel at Howell is \$160 per ton for steel free of asbestos and \$60 per ton for steel pipe with asbestos-contaminated coating. Salvage contractor will accept scrap at Howell and pay for transportation to salvage yard where material will be prepared for final salvage. Final preparation by the salvage contractor includes cutting material to proper size, cleaning tanks and vessels, removing pipe coating, etc.



10. The estimated gross salvage value of equipment assumes that equipment is at the end of its service life. Salvage contractor will accept equipment at Howell and pay for transportation to salvage yard where material will be prepared for final salvage.
11. No salvage allowance is included for underground storage field recoverable base gas.
12. ROW easements will revert back to deeded owners. ROW damages are estimated to be \$2 per foot. Legal fees and permit costs pertaining to ROW are included in management and overhead costs.
13. Abandonment costs are estimated in 2007 dollars.

**Southwest Gas Storage Company  
Final Abandonment Estimate**

**Howell Storage Field**

(Location: Livingston and Washtenaw Counties, Michigan)

**Summary**

	Estimated Cost (2007\$)
<b>I. Howell Storage Field Retirement</b>	
A. Clean and purge	\$184,960
B. Remove field lines	\$4,828,277
C. Pipe handling and storage	\$420,172
D. Plug and abandon wells	\$3,406,792
E. Restore well sites	\$1,880,410
F. Road crossings	\$1,879,695
G. Transite siding removal	\$52,118
H. Howell compressor station	\$2,151,904
<b>Total I.</b>	<b>\$14,804,329</b>
<b>II. Salvage</b>	
A. Equipment	(\$295,900)
B. Scrap steel	(\$628,480)
<b>Total II.</b>	<b>(\$924,380)</b>
<b>III. Contingency</b> (10% of I above)	\$1,480,433
<b>Total III.</b>	<b>\$1,480,433</b>
<b>Grand Total:</b>	<b>\$15,360,382</b>

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. Howell Storage Field Retirement**

**A. Clean and purge**

Description of Work:

Storage company personnel pig field lines and isolate field lines from wells and interconnects with compressor station. Abandonment pressure is assumed to be 150 psig. Storage company personnel blow down field lines to atmospheric pressure by flaring or venting. At this point field lines are filled with natural gas at atmospheric pressure. Storage company personnel then evacuate sections of pipe using pipeline evacuation equipment. At this point field lines are filled with air at atmospheric pressure. Storage company personnel blow down and evacuate compressor station. Storage field is ready for demolition work.

	Unit	No.	Days	Rate	Total
1 Pigging operation prior to final shutdown	person	2	34	\$1,000	\$68,000
2 Isolate field lines	person	2	2	\$1,000	\$4,000
3 Blowdown field lines	person	2	2	\$1,000	\$4,000
4 Pipeline evacuation	person	2	34	\$1,000	\$68,000
5 Compressor station blow down and evacuation	person	3	2	\$1,000	\$6,000
6 Gas loss in field lines (see note)	Mcf	5,273		\$6.63	\$34,960
				Total:	\$184,960

Note: Gas price per ICE Daily Indices, Panhandle pool gas price @ June 1, 2007.

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. Howell Storage Field Retirement**

**B. Remove field lines**

Description of Work:

Detailed cost estimate below reflects work required to remove 20" diameter field line located in storage field. Work includes trench excavation, cutting pipe into 40-ft sections, loading pipe onto pipe trucks and hauling to temporary storage yard, backfilling trench, and restoration of area. Time to achieve each task is based on the removal of one mile of 20" dia. pipe. Removal costs are adjusted for pipe diameters greater than or less than 20". Estimate also includes environmental inspection, storage company inspection, ROW damages, and storage company management and overhead costs.

1. Excavate trench (1 day)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	1	10	\$79.86	\$799
backhoe, Cat 325B	4	10	\$68.66	\$2,746
flatbed truck	1	10	\$22.78	\$228
1/2 ton pickup with 4wd	2	10	\$9.39	\$188
small tools, 2% of labor				\$165
Subtotal:				\$4,126

Labor	No.	Hours	Rate	Total
operator	5	10	\$68.88	\$3,444
teamster	1	10	\$55.09	\$551
laborer	4	10	\$52.67	\$2,107
foreman	1	10	\$79.22	\$792
per diem	1 day	crew size:	\$125.00	\$1,375
Subtotal:				\$8,269

Material	Total
allow 2% of labor	\$165
Subtotal:	\$165

Total Direct Costs (1) = \$12,560

2. Remove pipe from trench, cut pipe, load on trucks, and haul to storage yard (1 day)

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove, 30 ton	1	10	\$57.50	\$575
pipelayer, Cat, 572-R, 20' boom	3	10	\$67.38	\$2,021
pipe truck	2	10	\$47.45	\$949
flatbed truck	1	10	\$22.78	\$228
lowboy	1	10	\$53.15	\$531
3/4 ton pick-up with trailer	4	10	\$22.11	\$884
1/2 ton pickup with 4wd	2	10	\$9.39	\$188
small tools, 2% of labor				\$316
Subtotal:				\$5,693

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. B. Remove field lines (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator (hydrocrane)	1	10	\$71.87	\$719
operator	3	10	\$68.88	\$2,066
teamster	4	10	\$55.09	\$2,204
pipefitter/welder	4	10	\$77.76	\$3,110
helper	4	10	\$54.43	\$2,177
laborer	4	10	\$52.67	\$2,107
foreman	1	10	\$79.22	\$792
per diem	1 day	crew size: 21	\$125.00	\$2,625
Subtotal:				\$15,800

Material	Total
allow 2% of labor	\$316
Subtotal:	\$316

Total Direct Costs (2) = \$21,809

3. Backfill trench (1 day)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	2	10	\$79.86	\$1,597
track loader, Cat 953C	1	10	\$51.10	\$511
dump truck 14 cy	5	10	\$35.88	\$1,794
1/2 ton pickup with 4wd	2	10	\$9.39	\$188
small tools, 2% of labor				\$187
Subtotal:				\$4,277

Labor	No.	Hours	Rate	Total
operator	3	10	\$68.88	\$2,066
teamster (dump)	5	10	\$55.09	\$2,755
laborer	4	10	\$52.67	\$2,107
foreman	1	10	\$79.22	\$792
per diem	1 day	crew size: 13	\$125.00	\$1,625
Subtotal:				\$9,345

Material	Total
Backfill material (600 cy @ \$10 per cy)	\$6,000
Sales tax (6%)	\$360
Miscellaneous (2% of labor)	\$187
Subtotal:	\$6,547

Total Direct Costs (3) = \$20,169

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. B. Remove field lines (continued)**

4. Restore site (1 day)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	2	10	\$79.86	\$1,597
backhoe, Cat 325B	1	10	\$68.66	\$687
flatbed truck	2	10	\$22.78	\$456
dump truck 14 cy	2	10	\$35.88	\$718
1/2 ton pickup with 4wd	2	10	\$9.39	\$188
small tools, 2% of labor				\$173
Subtotal:				\$3,818

Labor	No.	Hours	Rate	Total
operator	3	10	\$68.88	\$2,066
teamster	4	10	\$55.09	\$2,204
laborer	4	10	\$52.67	\$2,107
foreman	1	10	\$79.22	\$792
per diem 1 day crew size:	12		\$125.00	\$1,500
Subtotal:				\$8,669

Material	Total
allow \$ 15,000 for topsoil, seed, fertilizer, straw bales, etc.	\$15,000
Sales tax @ 6%	\$900
Subtotal:	\$15,900

Total Direct Costs (4) = \$28,387

**Summary: Remove Field Lines**

A. Pipeline contractor costs	
1. Excavate trench	\$12,560
2. Remove pipe from trench, cut pipe, load on trucks, and haul to storage yard.	\$21,809
3. Backfill trench	\$20,169
4. Restore site	\$28,387
Pipeline contractor direct costs:	\$82,925
5% Mobilization	\$4,146
Subtotal:	\$87,071
15% Contractor overhead:	\$13,061
Subtotal:	\$100,132
10% Contractor profit:	\$10,013
Total pipeline contractor costs:	\$110,145

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. B. Remove field lines (continued)**

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

	\$5,507
Total environmental contractor costs:	\$5,507

C. Storage company inspection costs

1. Number of days per mile
2. Company cost per day

	2
	\$500
Total company inspection cost per mile:	\$1,000

D. ROW damages at \$2 per foot

Total ROW damage costs per mile:	\$10,560
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E. Storage company management and overhead costs (15% of A + B + C +D)

	\$19,082
Total management and overhead cost:	\$19,082

Total estimated cost to remove 1 mile of 20" dia. field line (A + B + C + D +E):	\$146,294
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Estimated cost per foot to remove 1 mile of 20" dia. field line:	\$28
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**Total Estimated Cost to Remove Field Lines**

Pipeline Diameter (in.)	Pipeline Volume (cu. in.)	Six-Tenths Factor (See Note)	Estimated Removal Cost/ft	Pipeline Length (ft)	Estimated Removal Cost
4	12.6	0.2358	\$7	2,664	\$18,648
6	28.3	0.2358	\$7	17,529	\$122,703
8	50.3	0.3330	\$9	5,835	\$52,515
10	78.5	0.4353	\$12	0	\$0
12	113.1	0.5417	\$15	16,945	\$254,175
14	153.9	0.6518	\$18	0	\$0
16	201.1	0.7651	\$21	0	\$0
18	254.5	0.8812	\$25	0	\$0
20	314.2	1.0000	\$28	156,437	\$4,380,236
22	380.1	1.1212	\$31	0	\$0
24	452.4	1.2446	\$35	0	\$0
Total:				199,410	\$4,828,277

Note: For pipe less than 6-inch dia. use six-tenths factor for 6-inch dia pipe.

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. Howell Storage Field Retirement**

**C. Pipe handling and storage**

Description of Work:

Detailed cost estimate below reflects work required to unload pipe from pipe trucks, store pipe in temporary storage yard, and load pipe onto carriers for transport to scap yard. Estimate is based on handling one mile of pipe per day. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

1. Unload pipe from pipe truck and stack in storage yard.

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove, 30 ton	1	10	\$57.50	\$575
1/2 ton pickup with 4wd	1	10	\$9.39	\$94
small tools, 2% of labor				\$61
Subtotal:				\$730

Labor	No.	Hours	Rate	Total
operator (hydrocrane)	1	10	\$71.87	\$719
laborer	2	10	\$52.67	\$1,053
foreman	1	10	\$79.22	\$792
per diem	1 day	crew size:	4	\$125.00
Subtotal:				\$3,064

Material	Total
allow 2% of labor	\$61
Subtotal:	\$61

Total Direct Costs (1) = \$3,856

2. Load pipe in storage yard onto salvage contractor's carriers.

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove, 30 ton	1	10	\$57.50	\$575
1/2 ton pickup with 4wd	1	10	\$9.39	\$94
small tools, 2% of labor				\$61
Subtotal:				\$730

Labor	No.	Hours	Rate	Total
operator (hydrocrane)	1	10	\$71.87	\$719
laborer	2	10	\$52.67	\$1,053
foreman	1	10	\$79.22	\$792
per diem	1 day	crew size:	4	\$125.00
Subtotal:				\$3,064



**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. C. Pipe handling and storage (continued)**

Line Item 2 (continued)

Material	Total
allow 2% of labor	\$61
Subtotal:	\$61

Total Direct Costs (2) = \$3,856

**Summary: Pipe handling and storage**

**A. Pipeline contractor costs**

1. Unload pipe from pipe trucks and stack in storage yard.	\$3,856
2. Load pipe in storage yard onto contract carriers.	\$3,856
Pipeline contractor direct costs:	\$7,712
5% Mobilization	\$386
Subtotal:	\$8,097
15% Contractor overhead:	\$1,215
Subtotal:	\$9,312
10% Contractor profit:	\$931
Total pipeline contractor costs:	\$10,243

**B. Environmental contractor costs (5% of pipeline contractor costs)**

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

Total environmental contractor costs:	\$512
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**C. Storage company inspection costs**

1. Number of days to unload and load per mile of pipe	2
2. Company cost per day	\$500
Total company inspection cost per mile:	\$1,000

**D. Storage company management and overhead costs (15% of A + B + C)**

Total management and overhead cost:	\$1,763
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Total estimated cost to handle and store 1 mile of field line (A + B + C + D):	\$13,518
Estimated cost per foot to handle and store 1 mile of field line:	\$2.56

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. C. Pipe handling and storage (continued)**

**Total Estimated Pipe Handling and Storage Cost**

Pipeline Diameter (in.)	Estimated Cost/ft	Pipeline Length (ft)	Estimated Cost
4	\$2.56	13,258	\$33,944
6	\$2.56	9,331	\$23,890
8	\$2.56	16,940	\$43,371
10	\$2.56	20,952	\$53,643
12	\$2.56	10,132	\$25,941
14	\$2.56	0	\$0
16	\$2.56	37,370	\$95,677
18	\$2.56	0	\$0
20	\$2.56	0	\$0
22	\$2.56	0	\$0
24	\$2.56	56,130	\$143,708
Total:			\$420,172

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. Howell Storage Field Retirement**

**D. Plug and abandon wells**

Description of Work:

Estimate below reflects work required to P&A injection/withdrawal and observation wells and remove above-ground well facilities. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

A. Plug and abandon wells

Unit	No.	Unit Cost	Total Cost
each	70	\$37,448	\$2,621,360
		Subtotal:	\$2,621,360

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

	\$131,068
Total environmental contractor costs:	\$131,068

C. Storage company inspection costs

	No. of Wells	Days Per Well	Total No. of Days
1. Number of inspector days	70	3	210
2. Company cost per day			\$1,000
Total company inspection cost:			\$210,000

D. Storage company management and overhead costs (15% of A + B + C)

	\$444,364
Total management and overhead cost:	\$444,364

Total estimated cost to plug and abandon wells (A + B + C + D): \$3,406,792

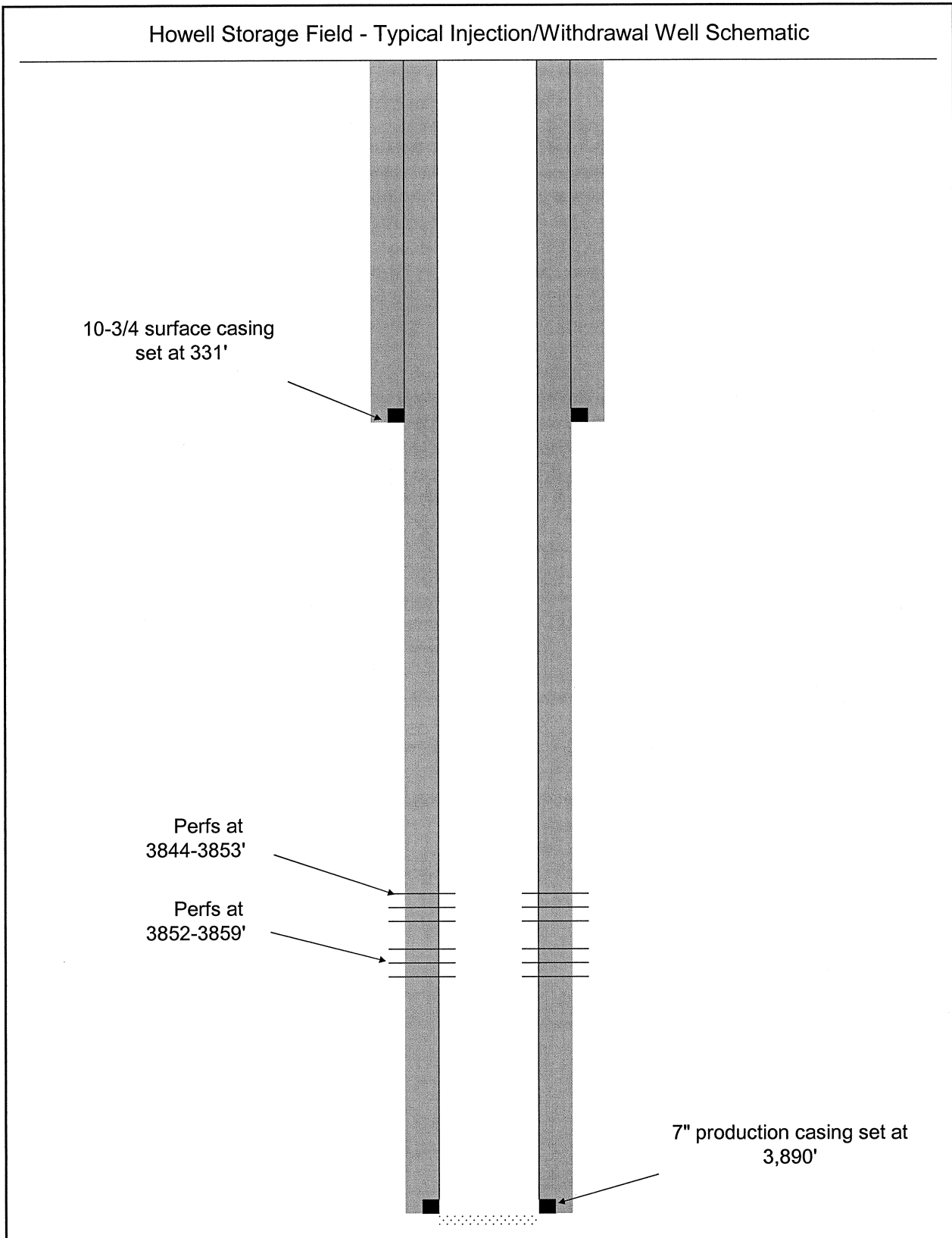
Howell Storage Field - Typical Injection/Withdrawal Well Schematic

10-3/4" surface casing  
set at 331'

Perfs at  
3844-3853'

Perfs at  
3852-3859'

7" production casing set at  
3,890'



**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. Howell Storage Field Retirement**

**E. Restore well sites**

Description of Work:

Detailed cost estimate below reflects work required to restore a well site. Work includes excavation of crushed stone (approximately 200' x 50' x 1/2') and restoration of area. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

1. Remove ROW fence and access work site (1/2 day)

Equipment	No.	Hours	Rate	Total
bobcat	1	5	\$11.87	\$59
flatbed truck	1	5	\$22.78	\$114
3/4 ton pick-up with trailer	1	5	\$22.11	\$111
1/2 ton pickup with 4wd	1	5	\$9.39	\$47
small tools, 2% of labor				\$51
Subtotal:				\$382

Labor	No.	Hours	Rate	Total
operator	1	5	\$53.79	\$269
teamster	1	5	\$55.09	\$275
pipefitter/welder	1	5	\$77.76	\$389
helper	1	5	\$54.43	\$272
laborer	2	5	\$52.67	\$527
foreman	1	5	\$79.22	\$396
per diem	1/2 day	crew size:	7	\$125.00
Subtotal:				\$2,566

Material	Total
allow 2% of labor	\$51
Subtotal:	\$51

Total Direct Costs (1) = \$2,999

2. Remove gravel and miscellaneous debris (1 day)

Equipment	No.	Hours	Rate	Total
track loader, Cat 953C	1	10	\$51.10	\$511
dump truck 14 cy	1	10	\$35.88	\$359
1/2 ton pickup with 4wd	1	10	\$9.39	\$94
small tools, 2% of labor				\$74
Subtotal:				\$1,038

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. E. Restore well sites (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator	1	10	\$68.88	\$689
teamster (dump)	1	10	\$55.09	\$551
laborer	2	10	\$52.67	\$1,053
foreman	1	10	\$79.22	\$792
per diem	1 day	crew size:	5	\$125.00
Subtotal:				\$3,710

Material	Total
Miscellaneous (2% of labor)	\$74
Subtotal:	\$74

Total Direct Costs (2) = \$4,822

3. Restore site (1 day)

Equipment	No.	Hours	Rate	Total
motor grader, Cat 135-H	1	10	\$38.15	\$381
flatbed truck	1	10	\$22.78	\$228
1/2 ton pickup with 4wd	2	10	\$9.39	\$188
small tools, 2% of labor				\$100
Subtotal:				\$897

Labor	No.	Hours	Rate	Total
operator	1	10	\$68.88	\$689
teamster (flatbed)	1	10	\$55.09	\$551
laborer	4	10	\$52.67	\$2,107
foreman	1	10	\$79.22	\$792
per diem	1 day	crew size:	7	\$125.00
Subtotal:				\$5,014

Material	Total
allow \$ 2000 for topsoil, seed, fertilizer, straw bales, etc.	\$2,000
Sales tax @ 6%	\$120
Subtotal:	\$2,120

Total Direct Costs (3) = \$8,031

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. E. Restore well sites (continued)**

**Summary: Restore Well Sites**

A. Pipeline contractor costs	
1. Remove ROW fence and access work site	\$2,999
2. Remove gravel and miscellaneous debris	\$4,822
3. Restore site	\$8,031
Pipeline contractor direct costs:	\$15,852
5% Mobilization	\$793
Subtotal:	\$16,645
15% Contractor overhead:	\$2,497
Subtotal:	\$19,142
10% Contractor profit:	\$1,914
Total pipeline contractor costs:	\$21,056
B. Environmental contractor costs (5% of pipeline contractor costs)	
This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.	
	\$1,053
Total environmental contractor costs:	\$1,053
C. Pipeline company inspection costs	
1. Number of days per site	2.5
2. Company inspection cost per day	\$500
Total company inspection cost per site:	\$1,250
D. Pipeline company management and overhead costs (15% of A + B + C)	
	\$3,504
Total management and overhead cost:	\$3,504
Total cost to restore well site (A + B + C + D):	\$26,863
No. of well sites:	70
Total estimated cost to restore well sites:	\$1,880,410

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. Howell Storage Field Retirement**

**F. Road crossings**

Description of Work:

Detailed cost estimate below reflects work required to retire a paved road or railroad crossing (100 feet) where pipeline diameter is greater than 12-inch. Work includes excavation and shoring of trench and road embankment, pulling pipe from casing as required, capping pipe ends, filling pipe with grout, backfilling and restoration of area. Estimate also includes environmental inspection, company inspection, and storage company management and overhead costs.

1. Remove ROW fence and access work sites (1/2 day)

Equipment	No.	Hours	Rate	Total
dozer, cat D-6	1	5	\$79.86	\$399
flatbed truck	1	5	\$22.78	\$114
3/4 ton pick-up with trailer	1	5	\$22.11	\$111
1/2 ton pickup with 4wd	2	5	\$9.39	\$94
small tools, 2% of labor				\$66
Subtotal:				\$784

Labor	No.	Hours	Rate	Total
operator	1	5	\$68.88	\$344
teamster	1	5	\$55.09	\$275
pipefitter/welder	1	5	\$77.76	\$389
helper	1	5	\$54.43	\$272
laborer	4	5	\$52.67	\$1,053
foreman	1	5	\$79.22	\$396
per diem	1/2 day	crew size:	9	\$125.00
Subtotal:				\$3,293

Material	Total
allow 2% of labor	\$66
Subtotal:	\$66

Total Direct Costs (1) = \$4,142

2. Excavate and cap pipe ends (1 day)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	1	10	\$68.66	\$687
flatbed truck	1	10	\$22.78	\$228
lowboy	1	10	\$53.15	\$531
3/4 ton pick-up with trailer	1	10	\$22.11	\$221
1/2 ton pickup with 4wd	2	10	\$9.39	\$188
small tools, 2% of labor				\$145
Subtotal:				\$2,000



**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. F. Road crossings (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator	1	10	\$68.88	\$689
teamster	2	10	\$55.09	\$1,102
pipefitter/welder	1	10	\$77.76	\$778
helper	1	10	\$54.43	\$544
laborer	4	10	\$52.67	\$2,107
foreman	1	10	\$79.22	\$792
per diem	1 day	crew size:	10	\$125.00
Subtotal:				\$7,261

Material	Total
allow 2% of labor	\$145
Subtotal:	\$145

Total Direct Costs (2) = \$9,407

3. Fill pipe or casing with grout, backfill trench, grade disturbed areas (1 day)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	1	10	\$68.66	\$687
dump truck 8 cy	1	10	\$22.52	\$225
concrete pump trailer mounted 25 cy/hr	1	10	\$13.75	\$137
1/2 ton pickup with 4wd	2	10	\$9.39	\$188
small tools, 2% of labor				\$114
Subtotal:				\$1,351

Labor	No.	Hours	Rate	Total
operator	1	10	\$68.88	\$689
operator (grout pump)	1	10	\$53.79	\$538
teamster (dump)	1	10	\$55.09	\$551
laborer	4	10	\$52.67	\$2,107
foreman	1	10	\$79.22	\$792
per diem	1 day	crew size:	8	\$125.00
Subtotal:				\$5,677

Material	Total
Grout @ \$82/cy (estimate 10 cy)	\$820
Sales tax (6%)	\$49
Miscellaneous (2% of labor)	\$114
Subtotal:	\$983

Total Direct Costs (3) = \$8,010

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. F. Road crossings (continued)**

4. Restore sites (1/2 day)

Equipment	No.	Hours	Rate	Total
flatbed truck	1	5	\$22.78	\$114
1/2 ton pickup with 4wd	2	5	\$9.39	\$94
small tools, 2% of labor				\$42
			Subtotal:	\$250

Labor	No.	Hours	Rate	Total
teamster (flatbed)	1	5	\$55.09	\$275
laborer	4	5	\$52.67	\$1,053
foreman	1	5	\$79.22	\$396
per diem 1/2 day crew size:	6		\$125.00	\$375
			Subtotal:	\$2,100

Material	Total
allow \$ 1000 for topsoil, seed, fertilizer, straw bales, etc.	\$1,000
Sales tax (6%)	\$60
	Subtotal: \$1,060

Total Direct Costs (4) = \$3,410

**Summary: Road Crossings**

A. Pipeline contractor costs

1. Remove ROW fence and access work sites	\$4,142
2. Excavate and cap pipe ends	\$9,407
3. Fill pipe or casing with grout, backfill trench, grade disturbed areas	\$8,010
4. Restore sites	\$3,410
Pipeline contractor direct costs:	\$24,969
5% Mobilization	\$1,248
Subtotal:	\$26,217
15% Contractor overhead:	\$3,933
Subtotal:	\$30,150
10% Contractor profit:	\$3,015
Total pipeline contractor costs:	\$33,165

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

	\$1,658
Total environmental contractor costs:	\$1,658

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. F. Road crossings (continued)**

C. Storage company inspection costs

1. Number of days per site	3
2. Company cost per day	\$500
Total company inspection cost per site:	\$1,500

D. Storage company management and overhead costs (15% of A + B + C)

	\$5,448
Total management and overhead cost:	\$5,448

Total cost to retire road crossing (A + B + C + D): \$41,771

No. of road crossings: 45

Total estimated cost to retire road crossings: \$1,879,695

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. Howell Storage Field Retirement**

**G. Transite siding removal**

Description of Work:

Detailed cost estimate below reflects work required to remove transite siding from compressor station buildings. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

**A. Remove transite siding (10 days)**

		Unit	No.	Unit Cost	Total
1. Compressor bldg	(80 x 40 x 30' height)	sf	7,200	\$3	\$21,600
2. Office bldg	(60' x 30' x 10' height)	sf	0	\$3	\$0
3. Warehouse bldg	(50' x 20' x 20' height)	sf	2,800	\$3	\$8,400
4. Maintenance shed	(25' x 25' x 20' height)	sf	2,000	\$3	\$6,000
5. Tech/shop bldg	(20' x 20' x 10' height)	sf	800	\$3	\$2,400
Total siding removal contractor costs:					\$38,400

**B. Environmental contractor costs (5% of transite contractor costs)**

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

	\$1,920
Total environmental contractor costs:	\$1,920

**C. Storage company inspection costs**

1. Number of days per site	10
2. Company cost per day	\$500
Total company inspection cost per site:	\$5,000

**D. Storage company management and overhead costs (15% of A + B + C)**

	\$6,798
Total management and overhead cost:	\$6,798

Total estimated cost to remove transite siding (A + B + C + D) : \$52,118

**Southwest Gas Storage Company  
Final Abandonment Estimate- Howell Storage Field**

**I. Howell Storage Field Retirement**

**H. Howell compressor station**

Description of Work:

Detailed cost estimate below reflects work required to retire Howell compressor station. Work includes removal of miscellaneous material, removal of valves, blowdowns, piping, equipment, compressor station buildings, meter runs, excavation of concrete foundations and gravel, and restoration of site. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead.

1. Remove miscellaneous material and access work site (2 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	1	20	\$68.66	\$1,373
flatbed truck	1	20	\$22.78	\$456
3/4 ton pick-up with trailer	1	20	\$22.11	\$442
1/2 ton pickup with 4wd	2	20	\$9.39	\$376
small tools, 2% of labor				\$263
Subtotal:				\$2,910

Labor	No.	Hours	Rate	Total
operator	1	20	\$68.88	\$1,378
teamster	1	20	\$55.09	\$1,102
pipefitter/welder	1	20	\$77.76	\$1,555
helper	1	20	\$54.43	\$1,089
laborer	4	20	\$52.67	\$4,214
foreman	1	20	\$79.22	\$1,584
per diem	2 days	crew size:	9	\$125.00
Subtotal:				\$13,171

Material	Total
allow 2% of labor	\$263
Subtotal:	\$263

Total Direct Costs (1) = \$16,345

2. Excavate, remove valves, blowdowns, meter runs and yard piping (15 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	2	150	\$68.66	\$20,599
bobcat	1	150	\$11.87	\$1,780
hydrocrane, Grove 30 ton	2	150	\$57.50	\$17,251
flatbed truck	2	150	\$22.78	\$6,834
lowboy	1	150	\$53.15	\$7,972
3/4 ton pick-up with trailer	4	150	\$22.11	\$13,264
1/2 ton pickup with 4wd	4	150	\$9.39	\$5,637
small tools, 2% of labor				\$5,572
Subtotal:				\$78,908

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. H. Howell compressor station (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator (backhoe, bobcat)	3	150	\$68.88	\$30,994
operator (hydrocrane)	2	150	\$71.87	\$21,560
teamster	3	150	\$55.09	\$24,791
pipefitter/welder	4	150	\$77.76	\$46,655
helper	4	150	\$54.43	\$32,658
laborer	8	150	\$52.67	\$63,204
foreman	1	150	\$79.22	\$11,882
per diem	15 days	crew size:	25	\$125.00
Subtotal:				\$278,619

Material	Total
allow 2% of labor	\$5,572
Subtotal:	\$5,572

Total Direct Costs (2) = \$363,100

3. Remove station equipment (15 days)

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove 30 ton	1	150	\$57.50	\$8,625
hydrocrane, Grove 50 ton	1	150	\$105.66	\$15,849
flatbed truck	1	150	\$22.78	\$3,417
lowboy	1	150	\$53.15	\$7,972
3/4 ton pick-up with trailer	4	150	\$22.11	\$13,264
1/2 ton pickup with 4wd	4	150	\$9.39	\$5,637
small tools, 2% of labor				\$4,637
Subtotal:				\$59,401

Labor	No.	Hours	Rate	Total
operator (crane)	2	150	\$71.87	\$21,560
teamster	2	150	\$55.09	\$16,527
pipefitter/welder	4	150	\$77.76	\$46,655
helper	4	150	\$54.43	\$32,658
laborer	8	150	\$52.67	\$63,204
foreman	1	150	\$79.22	\$11,882
per diem	15 days	crew size:	21	\$125.00
Subtotal:				\$231,862

Material	Total
allow 2% of labor	\$4,637
Subtotal:	\$4,637

Total Direct Costs (3) = \$295,900

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. H. Howell compressor station (continued)**

4. Remove station buildings (15 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B w grapple	2	150	\$76.03	\$22,810
hydrocrane, 30 ton	2	150	\$57.50	\$17,251
flatbed truck	2	150	\$22.78	\$6,834
lowboy	1	150	\$53.15	\$7,972
3/4 ton pick-up with trailer	4	150	\$22.11	\$13,264
1/2 ton pickup with 4wd	4	150	\$9.39	\$5,637
small tools, 2% of labor				\$5,328
Subtotal:				\$79,096

	Labor	No.	Hours	Rate	Total
operator		2	150	\$68.88	\$20,663
operator (hydrocrane)		2	150	\$71.87	\$21,560
teamster		3	150	\$55.09	\$24,791
pipefitter/welder		4	150	\$77.76	\$46,655
helper		4	150	\$54.43	\$32,658
laborer		8	150	\$52.67	\$63,204
foreman		1	150	\$79.22	\$11,882
per diem	15 days	crew size:	24	\$125.00	\$45,000
				Subtotal:	\$266,413

Material	Total
allow 2% of labor	\$5,328
Subtotal:	\$5,328

Total Direct Costs (4) = \$350,837

5. Demolish concrete foundations and compressor blocks to 2-ft below ground surface (15 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B w hammer	3	150	\$81.79	\$36,806
backhoe, Cat 325B	1	150	\$68.66	\$10,299
dump truck 14 cy	2	150	\$35.88	\$10,763
3/4 ton pick-up with trailer	2	150	\$22.11	\$6,632
1/2 ton pickup with 4wd	2	150	\$9.39	\$2,818
small tools, 2% of labor				\$3,382
Subtotal:				\$70,701

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. H. Howell compressor station (continued)**

Line Item 5 (continued)

Labor	No.	Hours	Rate	Total
operator	4	150	\$68.88	\$41,325
teamster (dump)	2	150	\$55.09	\$16,527
pipefitter/welder	2	150	\$77.76	\$23,327
helper	2	150	\$54.43	\$16,329
laborer	4	150	\$52.67	\$31,602
foreman	1	150	\$79.22	\$11,882
per diem	15 days	crew size:	15	\$125.00
Subtotal:				\$169,119

Material	Total
Miscellaneous (2% of labor)	\$3,382
Subtotal:	\$3,382

Total Direct Costs (5) = \$243,202

6. Restore site (5 days)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	1	50	\$79.86	\$3,993
motor grader, Cat 135-H	1	50	\$38.15	\$1,907
flatbed truck	1	50	\$22.78	\$1,139
1/2 ton pickup with 4wd	2	50	\$9.39	\$939
small tools, 2% of labor				\$583
Subtotal:				\$8,562

Labor	No.	Hours	Rate	Total
operator	2	50	\$68.88	\$6,888
teamster (flatbed)	1	50	\$55.09	\$2,755
laborer	4	50	\$52.67	\$10,534
foreman	1	50	\$79.22	\$3,961
per diem	5 days	crew size:	8	\$125.00
Subtotal:				\$29,137

Material	Total
allow \$ 10000 for backfill, topsoil, seed, fertilizer, straw bales, etc.	\$10,000
Sales tax @ 6%	\$600
Subtotal:	\$10,600

Total Direct Costs (6) = \$48,299



**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**I. H. Howell compressor station (continued)**

**Summary: Howell Compressor Station**

<b>A. Pipeline contractor costs</b>	
1. Remove miscellaneous material and access work site	\$16,345
2. Excavate, remove valves, blowdowns, meter runs and yard piping	\$363,100
3. Remove station equipment	\$295,900
4. Remove station buildings	\$350,837
5. Demolish concrete foundation and compressor blocks to 2-ft below ground surface	\$243,202
6. Restore site	<u>\$48,299</u>
Pipeline contractor direct costs:	\$1,317,682
5% Mobilization	<u>\$65,884</u>
Subtotal:	\$1,383,566
15% Contractor overhead:	<u>\$207,535</u>
Subtotal:	\$1,591,101
10% Contractor profit:	<u>\$159,110</u>
Total pipeline contractor costs:	<u>\$1,750,211</u>
<b>B. Environmental contractor costs (5% of pipeline contractor costs)</b>	
This section reflects work performed by environmental contractor to check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.	
	<u>\$87,511</u>
Total environmental contractor costs:	<u>\$87,511</u>
<b>C. Storage company inspection costs</b>	
1. Number of days per site	67
2. Company cost per day	<u>\$500</u>
Total company inspection cost per site:	<u>\$33,500</u>
<b>D. Storage company management and overhead costs (15% of A + B + C)</b>	
	<u>\$280,683</u>
Total management and overhead cost:	<u>\$280,683</u>
 Total cost to retire Howell compressor station (A + B + C + D):	 <u>\$2,151,904</u>

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**II. Salvage**

**A. Equipment**

	Estimated Salvage (2007\$)
1 Howell compressor station	(\$295,900)
<b>Total equipment salvage:</b>	<b>(\$295,900)</b>

**B. Scrap Steel**

	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
1 Buildings			
a. Compressor station	400	(\$160)	(\$64,000)
b. Warehouse bldg	75	(\$160)	(\$12,000)
c. Maintenance shed	25	(\$160)	(\$4,000)
		<b>Subtotal:</b>	<b>(\$80,000)</b>

	Pipe Removed (ft)	Weight Per Foot (lbs)	Total Weight (lbs)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
2 Field lines						
a. 4-inch pipe	2,664	10.79	28,745	14	(\$60)	(\$840)
b. 6-inch pipe	17,529	18.97	332,525	166	(\$60)	(\$9,960)
c. 8-inch pipe	5,835	24.70	144,125	72	(\$60)	(\$4,320)
d. 10-inch pipe	0	34.24	0	0	(\$60)	\$0
e. 12-inch pipe	16,945	43.77	741,683	371	(\$60)	(\$22,260)
f. 14-inch pipe	0	54.57	0	0	(\$60)	\$0
g. 16-inch pipe	0	62.58	0	0	(\$60)	\$0
h. 18-inch pipe	0	82.15	0	0	(\$60)	\$0
i. 20-inch pipe	156,437	104.13	16,289,785	8145	(\$60)	(\$488,700)
j. 22-inch pipe	0	114.81	0	0	(\$60)	\$0
k. 24-inch pipe	0	140.68	0	0	(\$60)	\$0
					<b>Subtotal:</b>	<b>(\$526,080)</b>

	No. of Wells	Length Per Well (ft)	Weight Per Foot (lbs)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
3 Well tubing						
a. No tubing	0	0	0.00	0	(\$160)	\$0

	No. of Wells	Equipment Per Well (ton)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
4 Well site equipment					
a. Well head equipment	70	2	140	(\$160)	(\$22,400)

**Total scrap steel salvage: (\$628,480)**

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**Pipeline Contractor Labor Rates and Storage Company Inspection Cost**

A Pipeline contractor labor rates

	(Note 1)	(Note 2)	(Note 3)	(Note 4)		
	Sept 2006		June 2007		June 2007	
	Labor Rate		Labor Rate		Labor	June 2007
	Including		Including		Overhead	Labor Rate
	Fringe	Escalation	Fringe	Overtime	25% of	Pipeline
	Benefits	Factor	Benefits	Factor	for June 2007	Demolition
Trade	(\$/hr)		(\$/hr)		Base Rate	Estimate
1 Operating engineers:						
2 Crane operator	\$49.27	1.02	\$50.26	1.18	\$59.30	\$71.87
3 Heavy equipment	\$47.22	1.02	\$48.16	1.18	\$56.83	\$68.88
4 Small equipment	\$36.88	1.02	\$37.62	1.18	\$44.39	\$53.79
5 Pipefitter/welder	\$53.31	1.02	\$54.38	1.18	\$64.16	\$77.76
6 Pipefitter/welder helper	\$37.32	1.02	\$38.06	1.18	\$44.91	\$54.43
7 Electrician	\$51.88	1.02	\$52.92	1.18	\$62.44	\$75.67
8 Electrician helper	\$36.32	1.02	\$37.04	1.18	\$43.71	\$52.97
9 Teamster	\$37.77	1.02	\$38.53	1.18	\$45.46	\$55.09
10 Laborer	\$36.11	1.02	\$36.83	1.18	\$43.46	\$52.67
11 Foreman	\$54.31	1.02	\$55.40	1.18	\$65.37	\$79.22
Labor overhead factor:	25%					
Per diem:	\$125					

B. Storage company inspection costs

	Estimated Cost per day
1 Pipeline and compressor station	\$500
2 Well P&A	\$1,000

Note: Inspection costs include direct labor, per diem, and transportation costs.

Notes

- 1 Hourly union pay scales, September 2006, Detroit, Michigan (ENR September 25, 2006).
- 2 Escalation factor based on ENR construction cost indices September 2006 of 7763 and June 2007 of 7939 per ENR 6/4/07.
- 3 Work 6-day week, 10-hr day. See workpapers for calculation of overtime factor.
- 4 FICA, unemployment compensation, and workers compensation insurance that employers must pay.

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**Pipeline Contractor Equipment Rates**

Equipment Description	(Note 1)	(Note 2)	
	July 2005 Equipment Rate (\$/hr)	Escalation Factor	June 2007 Equipment Rate (\$/hr)
1 air compressor, 160 cfm with hose	\$13.92	1.07	\$14.89
2 paving breaker	\$0.70	1.07	\$0.75
3 concrete pump trailer mounted 25 cy/hr	\$12.85	1.07	\$13.75
4 concrete pump trailer mounted 67 cy/hr	\$53.23	1.07	\$56.96
5 crane, 25 ton, Grove hydrocrane 152 hp	\$47.86	1.07	\$51.21
6 crane, 30 ton, Grove hydrocrane 152 hp	\$53.74	1.07	\$57.50
7 crane, 50 ton, Grove hydrocrane 400 hp	\$98.75	1.07	\$105.66
8 motor grader, Cat 135-H, 135 hp	\$35.65	1.07	\$38.15
9 hydraulic excavator, Bobcat 53, 0.10 cy	\$11.09	1.07	\$11.87
10 hydraulic excavator, Cat 325B, 1.75 cy	\$64.17	1.07	\$68.66
11 hydraulic excavator, Cat 312C, 0.68 cy	\$29.30	1.07	\$31.35
12 hydraulic hammer, NPK, 1300-ft-lb	\$12.27	1.07	\$13.13
13 hydraulic grapple, Labounty 140 TW	\$6.89	1.07	\$7.37
14 lights, 6/1000W, 8 KW gen, trailer mtd.	\$5.55	1.07	\$5.94
15 pipelayer, Cat 561M, 18 ft boom, 40,000 lbs capacity	\$33.07	1.07	\$35.38
16 pipelayer, Cat 572R, 20 ft boom, 90,000 lbs capacity	\$62.97	1.07	\$67.38
17 tractor, Cat D-6R, 165 hp	\$74.64	1.07	\$79.86
18 winch for D-6R dozer	\$6.92	1.07	\$7.40
19 track loader, Cat 953C, 2.25 cy	\$47.76	1.07	\$51.10
20 dump truck 8 cy	\$21.05	1.07	\$22.52
21 dump truck 14 cy	\$33.53	1.07	\$35.88
22 flatbed truck	\$21.29	1.07	\$22.78
23 pipe truck	\$44.35	1.07	\$47.45
24 lowboy 50 ton	\$49.67	1.07	\$53.15
25 1/2 ton pickup, 4wd	\$8.78	1.07	\$9.39
26 3/4 ton pickup, 4wd	\$10.79	1.07	\$11.55
27 welder, trailer mounted, 45 hp	\$9.87	1.07	\$10.56

Notes

- Hourly Equipment Rates from July 2005, US Army Corps of Engineers Construction Equipment Ownership and Operating Expense Schedule, Region II.
- Escalation factor based on ENR construction cost indices July 2005 of 7422 and June 2007 of 7939 per ENR 3/19/07 and 6/4/07.

**Southwest Gas Storage Company  
Final Abandonment Estimate - Howell Storage Field**

**Workpapers**

A. Overtime factor for 6-10 hour days worked per week

	Hours Worked	Overtime Factor	Pay units
Straight-time 8 hours/day M-F	40	1	40
Overtime 2 hours/day M-F	10	1.5	15
Overtime Saturday first 8 hours	8	1.5	12
Overtime Saturday last 2 hours	2	2	4
Total:	60		71

Overtime factor: 1.18

B. Estimated number of environmental tests

	No. of Sites	Tests per Site	Total
1 Well sites	70	1	70
2 Compressor station	4	9	36
3 Miscellaneous @ 1 per 5000 sf	26	1	26
			106

C. Compressor equipment

	Engine	Rated HP
1	1601	1000
2	1602	1000
3	1603	2000
4	1604	2000
		6000

D. Field line mileage

Field Line Length (ft)	Field Line Length (mile)
199,410	37.77

**Southwest Gas Storage Company  
Final Abandonment Estimate**

**Waverly Storage Field**

(Location: Morgan and Sangamon Counties, Illinois)

**General Assumptions**

1. Southwest Gas Storage final abandonment projects will be conducted independently.
2. Southwest Gas Storage management team will begin preparation for its Waverly final abandonment two years prior to the scheduled abandonment. Southwest Gas Storage will manage and coordinate retirement activities prior to and during the actual retirement or hire a construction manager to perform these duties. Demolition work will be completed one year after work commences.
3. Southwest Gas Storage will file a FERC Section 7(b) abandonment application for the Waverly abandonment project that will include a complete environmental report concerning the proposed final abandonment activities.
4. All above ground facilities will be removed and disturbed areas restored.
5. Field lines will be purged of hydrocarbons, cut in 40 foot sections, and removed.
6. All underground storage field injection/withdrawal, disposal, and observation wells will be plugged and abandoned. Well head equipment and tubing will be salvaged.
7. Southwest Gas Storage will hire an environmental contractor to monitor retirement work and check for the presence of hazardous materials. Work will involve inspection, sampling, evaluation, and report writing. It is estimated that environmental contractor costs will be 5 percent of demolition contractor's costs.
8. Southwest Gas Storage inspection costs are estimated to be \$500 per day per inspector for pipeline and compressor station removal and \$1,000 per day per inspector for well P&A.
9. The estimated scrap value of carbon steel at Waverly is \$160 per ton for steel free of asbestos and \$60 per ton for steel pipe with asbestos-contaminated coating. Salvage contractor will accept scrap at Waverly and pay for transportation to salvage yard where material will be prepared for final salvage. Final preparation by the salvage contractor includes cutting material to proper size, cleaning tanks and vessels, removing pipe coating, etc.

10. The estimated gross salvage value of equipment assumes that equipment is at the end of its service life. Salvage contractor will accept equipment at Waverly and pay for transportation to salvage yard where material will be prepared for final salvage.
11. No salvage allowance is included for underground storage field recoverable base gas.
12. ROW easements will revert back to deeded owners. ROW damages are estimated to be \$2 per foot. Legal fees and permit costs pertaining to ROW are included in management and overhead costs.
13. Abandonment costs are estimated in 2007 dollars.

**Southwest Gas Storage Company  
Final Abandonment Estimate**

**Waverly Storage Field**

(Location: Morgan and Sangamon Counties, Illinois)

**Summary**

	Estimated Cost (2007\$)
<b>I. Waverly Storage Field Retirement</b>	
A. Clean and purge	\$129,308
B. Remove field lines	\$1,143,808
C. Pipe handling and storage	\$172,432
D. Plug and abandon wells	\$2,985,242
E. Remove heaters	\$1,389,450
F. Restore well sites	\$2,676,177
G. Road crossings	\$241,530
H. Transite siding removal	\$104,499
I. Waverly compressor station	\$2,130,945
<b>Total I.</b>	<b>\$10,973,392</b>
<b>II. Salvage</b>	
A. Equipment	(\$297,113)
B. Scrap steel	(\$361,320)
<b>Total II.</b>	<b>(\$658,433)</b>
<b>III. Contingency</b> (10% of I above)	\$1,097,339
<b>Total III</b>	<b>\$1,097,339</b>
<b>Grand Total:</b>	<b>\$11,412,298</b>



**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. Waverly Storage Field Retirement**

**A. Clean and purge**

Description of Work:

Storage company personnel pig field lines and isolate field lines from wells and interconnects with compressor station. Abandonment pressure is assumed to be 75 psig. Storage company personnel blow down field lines to atmospheric pressure by flaring or venting. At this point field lines are filled with natural gas at atmospheric pressure. Storage company personnel then evacuate sections of pipe using pipeline evacuation equipment. At this point field lines are filled with air at atmospheric pressure. Storage company personnel blow down and evacuate compressor station. Storage field is ready for demolition work.

	Unit	No.	Days	Rate	Total
1 Pigging operation prior to final shutdown	person	2	27	\$1,000	\$54,000
2 Isolate field lines	person	3	2	\$1,000	\$6,000
3 Blowdown field lines	person	3	2	\$1,000	\$6,000
4 Pipeline evacuation	person	2	27	\$1,000	\$54,000
5 Compressor station blow down and evacuation	person	3	2	\$1,000	\$6,000
6 Gas loss in field lines (see note)	Mcf	499		\$6.63	\$3,308
				Total:	\$129,308

Note: Gas price per ICE Daily Indices, Panhandle pool gas price @ June 1, 2007.

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. Waverly Storage Field Retirement**

**B. Remove field lines**

Description of Work:

Detailed cost estimate below reflects work required to remove 20" diameter field line located in storage field. Work includes trench excavation, cutting pipe into 40-ft sections, loading pipe onto pipe trucks and hauling to temporary storage yard, backfilling trench, and restoration of area. Time to achieve each task is based on the removal of one mile of 20" dia. pipe. Removal costs are adjusted for pipe diameters greater than or less than 20". Estimate also includes environmental inspection, storage company inspection, ROW damages, and storage company management and overhead costs.

1. Excavate trench (1 day)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	1	10	\$77.38	\$774
backhoe, Cat 325B	4	10	\$66.81	\$2,672
flatbed truck	1	10	\$21.96	\$220
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$28
Subtotal:				\$3,875

	Labor	No.	Hours	Rate	Total
operator		5	10	\$60.28	\$3,014
teamster		1	10	\$46.51	\$465
laborer		4	10	\$50.60	\$2,024
foreman		1	10	\$72.75	\$728
per diem	1 day	crew size	11	\$125.00	\$1,375
				Subtotal:	\$7,606

Material	Total
allow 2% of labor	\$28
Subtotal:	\$28

Total Direct Costs (1) = \$11,509

2. Remove pipe from trench, cut pipe, load on trucks, and haul to storage yard (1 day)

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove, 30 ton	1	10	\$55.97	\$560
pipelayer, Cat, 572-R, 20' boom	3	10	\$65.68	\$1,970
pipe truck	2	10	\$45.56	\$911
flatbed truck	1	10	\$21.96	\$220
lowboy	1	10	\$50.97	\$510
3/4 ton pick-up with trailer	4	10	\$21.29	\$852
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$290
Subtotal:				\$5,494

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. B. Remove field lines (continued)**

Line Item 2 (continued)

Labor		No.	Hours	Rate	Total
operator (hydrocrane)		1	10	\$60.28	\$603
operator		3	10	\$60.28	\$1,809
teamster		4	10	\$46.51	\$1,861
pipefitter/welder		4	10	\$71.30	\$2,852
helper		4	10	\$49.91	\$1,996
laborer		4	10	\$50.60	\$2,024
foreman		1	10	\$72.75	\$728
per diem	1 day	crew size	21	\$125.00	\$2,625
Subtotal:					\$14,497

Material		Total
allow 2% of labor		\$290
Subtotal:		\$290

Total Direct Costs (2) = \$20,281

**3. Backfill trench (1 day)**

Equipment		No.	Hours	Rate	Total
dozer, Cat D-6		2	10	\$77.38	\$1,548
track loader, Cat 953C		1	10	\$49.43	\$494
dump truck 14 cy		5	10	\$34.41	\$1,721
1/2 ton pickup with 4wd		2	10	\$9.11	\$182
small tools, 2% of labor					\$170
Subtotal:					\$4,115

Labor		No.	Hours	Rate	Total
operator		3	10	\$60.28	\$1,809
teamster (dump)		5	10	\$46.51	\$2,326
laborer		4	10	\$50.60	\$2,024
foreman		1	10	\$72.75	\$728
per diem	1 day	crew size	13	\$125.00	\$1,625
Subtotal:					\$8,511

Material		Total
Backfill material (600 cy @ \$10 per cy)		\$6,000
Sales tax (8%)		\$480
Miscellaneous (2% of labor)		\$170
Subtotal:		\$6,650

Total Direct Costs (3) = \$19,276

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. B. Remove field lines (continued)**

4. Restore site (1 day)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	2	10	\$77.38	\$1,548
backhoe, Cat 325B	1	10	\$66.81	\$668
flatbed truck	2	10	\$21.96	\$439
dump truck 14 cy	2	10	\$34.41	\$688
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$158
Subtotal:				\$3,684

	Labor	No.	Hours	Rate	Total
operator		3	10	\$60.28	\$1,809
teamster		4	10	\$46.51	\$1,861
laborer		4	10	\$50.60	\$2,024
foreman		1	10	\$72.75	\$728
per diem	1 day	crew size	12	\$125.00	\$1,500
				Subtotal:	\$7,921

Material	Total
allow \$ 15,000 for topsoil, seed, fertilizer, straw bales, etc.	\$15,000
Sales tax @ 8%	\$1,200
Subtotal:	\$16,200

Total Direct Costs (4) = \$27,804

**Summary: Remove Field Lines**

A. Pipeline contractor costs	
1. Excavate trench	\$11,509
2. Remove pipe from trench, cut pipe, load on trucks, and haul to storage yard.	\$20,281
3. Backfill trench	\$19,276
4. Restore site	\$27,804
Pipeline contractor direct costs:	\$78,870
5% Mobilization	\$3,943
Subtotal:	\$82,813
15% Contractor overhead:	\$12,422
Subtotal:	\$95,235
10% Contractor profit:	\$9,524
Total pipeline contractor costs:	\$104,759

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. B. Remove field lines (continued)**

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

\$5,238  
Total environmental contractor costs: \$5,238

C. Storage company inspection costs

1. Number of days per mile 2  
2. Company cost per day \$500  
Total company inspection cost per mile: \$1,000

D. ROW damages at \$2 per foot Total ROW damage costs per mile: \$10,560

E. Storage company management and overhead costs (15% of A + B + C + D)  
\$18,233  
Total management and overhead cost: \$18,233

Total estimated cost to remove 1 mile of 20" dia. field line (A + B + C + D + E): \$139,790  
Estimated cost per foot to remove 1 mile of 20" dia. field line: \$26

**Total Estimated Cost to Remove Field Lines**

Pipeline Diameter (in.)	Pipeline Volume (cu. in.)	Six-Tenths Factor (See Note)	Estimated Removal Cost/ft	Pipeline Length (ft)	Estimated Removal Cost
4	12.6	0.2358	\$6	10,731	\$64,386
6	28.3	0.2358	\$6	5,248	\$31,488
8	50.3	0.3330	\$9	13,650	\$122,850
10	78.5	0.4353	\$11	1,462	\$16,082
12	113.1	0.5417	\$14	5,047	\$70,658
14	153.9	0.6518	\$17	0	\$0
16	201.1	0.7651	\$20	24,642	\$492,840
18	254.5	0.8812	\$23	0	\$0
20	314.2	1.0000	\$26	0	\$0
22	380.1	1.1212	\$29	0	\$0
24	452.4	1.2446	\$32	10,797	\$345,504
Total:				71,577	\$1,143,808

Note: For pipe less than 6-inch dia. use six-tenths factor for 6-inch dia pipe.

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. Waverly Storage Field Retirement**

**C. Pipe handling and storage**

Description of Work:

Detailed cost estimate below reflects work required to unload pipe from pipe trucks, store pipe in temporary storage yard and load pipe onto carriers for transport to scap yard. Estimate is based on handling one mile of pipe per day. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

1. Unload pipe from pipe truck and stack in storage yard.

Equipment		No.	Hours	Rate	Total
hydrocrane, Grove, 30 ton		1	10	\$55.97	\$560
1/2 ton pickup with 4wd		1	10	\$9.11	\$91
small tools, 2% of labor					\$57
				Subtotal:	\$708
Labor		No.	Hours	Rate	Total
operator (hydrocrane)		1	10	\$60.28	\$603
laborer		2	10	\$50.60	\$1,012
foreman		1	10	\$72.75	\$728
per diem	1 day	crew size:	4	\$125.00	\$500
				Subtotal:	\$2,842
Material					Total
allow 2% of labor					\$57
				Subtotal:	\$57
Total Direct Costs (1) =					\$3,607

2. Load pipe in storage yard onto salvage contractor's carriers.

Equipment		No.	Hours	Rate	Total
hydrocrane, Grove, 30 ton		1	10	\$55.97	\$560
1/2 ton pickup with 4wd		1	10	\$9.11	\$91
small tools, 2% of labor					\$57
				Subtotal:	\$708
Labor		No.	Hours	Rate	Total
operator (hydrocrane)		1	10	\$60.28	\$603
laborer		2	10	\$50.60	\$1,012
foreman		1	10	\$72.75	\$728
per diem	1 day	crew size:	4	\$125.00	\$500
				Subtotal:	\$2,842

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. C. Pipe handling and storage (continued)**

Line Item 2 (continued)

Material	Total
allow 2% of labor	\$57
Subtotal:	\$57
Total Direct Costs (2) =	\$3,607

**Summary: Pipe handling and storage**

A. Pipeline contractor costs		
1. Unload pipe from pipe trucks and stack in storage yard.		\$3,607
2. Load pipe in storage yard onto contract carriers.		\$3,607
	Pipeline contractor direct costs:	\$7,214
	5% Mobilization	\$361
	Subtotal:	\$7,574
	15% Contractor overhead:	\$1,136
	Subtotal:	\$8,711
	10% Contractor profit:	\$871
	Total pipeline contractor costs:	\$9,582
B. Environmental contractor costs (5% of pipeline contractor costs)		
This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.		\$479
	Total environmental contractor costs:	\$479
C. Storage company inspection costs		
1. Number of days to unload and load per mile of pipe		2
2. Company cost per day		\$500
	Total company inspection cost per mile:	\$1,000
D. Storage company management and overhead costs (15% of A + B + C)		
		\$1,659
	Total management and overhead cost:	\$1,659
Total estimated cost to handle and store 1 mile of field line (A + B + C + D):		\$12,720
Estimated cost per foot to handle and store 1 mile of field line:		\$2.41

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. C. Pipe handling and storage (continued)**

**Total Estimated Pipe Handling and Storage Cost**

Pipeline Diameter (in.)	Estimated Cost/ft	Pipeline Length (ft)	Estimated Cost
4	\$2.41	10,731	\$25,851
6	\$2.41	5,248	\$12,643
8	\$2.41	13,650	\$32,883
10	\$2.41	1,462	\$3,522
12	\$2.41	5,047	\$12,158
14	\$2.41	0	\$0
16	\$2.41	24,642	\$59,364
18	\$2.41	0	\$0
20	\$2.41	0	\$0
22	\$2.41	0	\$0
24	\$2.41	10,797	\$26,010
Total:			\$172,432



**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. Waverly Storage Field Retirement**

**D. Plug and abandon wells**

Description of Work:

Estimate below reflects work required to P&A injection/withdrawal, observation, and salt water disposal wells and remove above-ground well facilities. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

A. Plug and abandon wells

Unit	No.	Unit Cost	Total Cost
each	107	\$20,248	\$2,166,536
		Subtotal:	\$2,166,536

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

	\$108,327
Total environmental contractor costs:	\$108,327

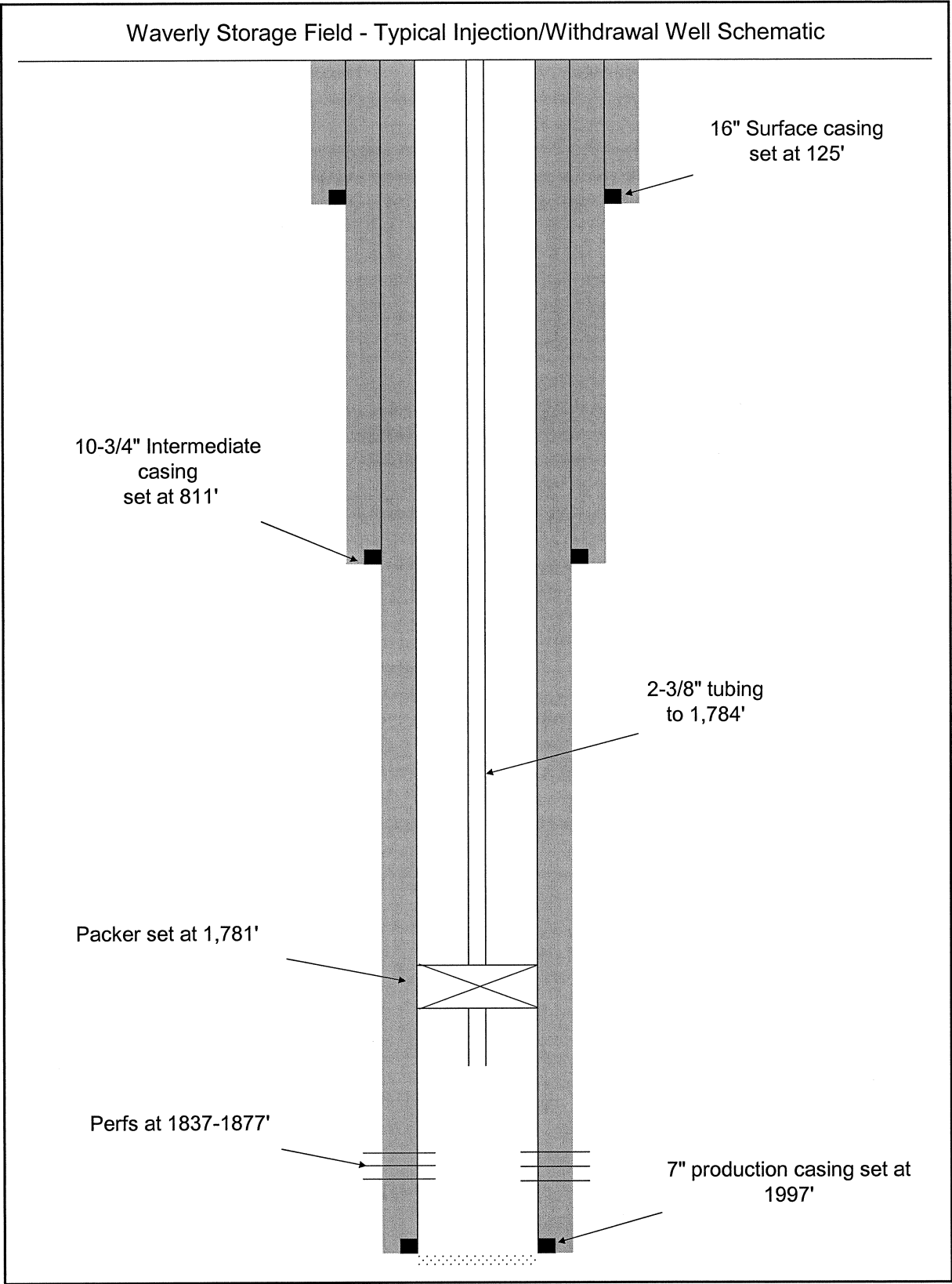
C. Storage company inspection costs

	No. of Wells	Days Per Well	Total No. of Days
1. Number of inspector days	107	3	321
2. Company cost per day			\$1,000
Total company inspection cost:			\$321,000

D. Storage company management and overhead costs (15% of A + B + C)

	\$389,379
Total management and overhead cost:	\$389,379

Total estimated cost to plug and abandon wells (A + B + C + D): **\$2,985,242**



**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. Waverly Storage Field Retirement**

**E. Remove heaters**

Description of Work:

Detailed estimate below reflects work required to remove well head heaters and piping. Work includes removing heaters, piping, and concrete piers. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

1. Remove heater and piping (1 day)

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove 30 ton	1	10	\$55.97	\$560
backhoe, Cat 312C	1	10	\$30.46	\$305
flatbed truck	1	10	\$21.96	\$220
lowboy	1	10	\$50.97	\$510
3/4 ton pick-up with trailer	1	10	\$21.29	\$213
1/2 ton pickup with 4wd	1	10	\$9.11	\$91
small tools, 2% of labor				\$124
Subtotal:				\$2,022

Labor	No.	Hours	Rate	Total
operator (crane)	1	10	\$60.28	\$603
operator (backhoe)	1	10	\$60.28	\$603
teamster	2	10	\$46.51	\$930
pipefitter/welder	1	10	\$71.30	\$713
helper	1	10	\$49.91	\$499
laborer	2	10	\$50.60	\$1,012
foreman	1	10	\$72.75	\$728
per diem	1 day	crew size:	9	\$125.00
Subtotal:				\$6,213

Material	Total
allow 2% of labor	\$124
Subtotal:	\$124

Total Direct Costs (1) = \$8,359

2. Remove concrete piers (1/2 day)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 312C	1	5	\$30.46	\$152
flatbed truck	1	5	\$21.96	\$110
lowboy	1	5	\$50.97	\$255
1/2 ton pickup with 4wd	1	5	\$9.11	\$46
small tools, 2% of labor				\$40
Subtotal:				\$603

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. E. Remove heaters (continued)**

Line Item 2 (continued)

Labor		No.	Hours	Rate	Total
operator		1	5	\$60.28	\$301
teamster		2	5	\$46.51	\$465
laborer		2	5	\$50.60	\$506
foreman		1	5	\$72.75	\$364
per diem	1/2 day	crew size: 6		\$125.00	\$375
Subtotal:					\$2,011

Material	Total
allow 2% of labor	\$40
Subtotal:	\$40

Total Direct Costs (2) = \$2,654

A. Pipeline contractor costs

1. Remove heater and piping	\$8,359
2. Remove concrete piers	\$2,654
Pipeline contractor direct costs:	\$11,013
5% Mobilization	\$551
Subtotal:	\$11,564
15% Contractor overhead:	\$1,735
Subtotal:	\$13,298
10% Contractor profit:	\$1,330
Total pipeline contractor costs:	\$14,628

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.	\$731
Total environmental contractor costs:	\$731

C. Storage company inspection costs

1. Number of days to remove heaters	1.5
2. Company cost per day	\$500
Total company inspection cost per mile:	\$750

D. Storage company management and overhead costs (15% of A + B + C)

	\$2,416
Total management and overhead cost:	\$2,416

Total cost to remove heaters (A + B + C + D): \$18,526  
No. of well sites: 75  
Total estimated cost to remove heaters: \$1,389,450

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. Waverly Storage Field Retirement**

**F. Restore well sites**

Description of Work:

Detailed cost estimate below reflects work required to restore a well site. Work includes excavation of crushed stone (approximately 200' x 50' x 1/2') and restoration of area. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

1. Remove ROW fence and access work site (1/2 day)

Equipment	No.	Hours	Rate	Total
bobcat	1	5	\$11.47	\$57
flatbed truck	1	5	\$21.96	\$110
3/4 ton pick-up with trailer	1	5	\$21.29	\$106
1/2 ton pickup with 4wd	1	5	\$9.11	\$46
small tools, 2% of labor				\$49
Subtotal:				\$368

Labor	No.	Hours	Rate	Total
operator	1	5	\$60.28	\$301
teamster	1	5	\$46.51	\$233
pipefitter/welder	1	5	\$71.30	\$356
helper	1	5	\$49.91	\$250
laborer	2	5	\$50.60	\$506
foreman	1	5	\$72.75	\$364
per diem	1/2 day	crew size:	7	\$125.00
Subtotal:				\$2,447

Material	Total
allow 2% of labor	\$49
Subtotal:	\$49

Total Direct Costs (1) = \$2,864

2. Remove gravel and miscellaneous debris (1 day)

Equipment	No.	Hours	Rate	Total
track loader, Cat 953C	1	10	\$49.43	\$494
dump truck 14 cy	1	10	\$34.41	\$344
1/2 ton pickup with 4wd	1	10	\$9.11	\$91
small tools, 2% of labor				\$69
Subtotal:				\$998

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. F. Restore well sites (continued)**

Line Item 2 (continued)

Labor		No.	Hours	Rate	Total
operator		1	10	\$60.28	\$603
teamster (dump)		1	10	\$46.51	\$465
laborer		2	10	\$50.60	\$1,012
foreman		1	10	\$72.75	\$728
per diem	1 day	crew size:	5	\$125.00	\$625
Subtotal:					\$3,433

Material		Total			
Miscellaneous (2% of labor)		\$69			
Subtotal:					\$69

Total Direct Costs (2) = \$4,499

3. Restore site (1/2 day)

Equipment		No.	Hours	Rate	Total
motor grader, Cat 135-H		1	5	\$37.00	\$185
flatbed truck		1	5	\$21.96	\$110
1/2 ton pickup with 4wd		2	5	\$9.11	\$91
small tools, 2% of labor					\$94
Subtotal:					\$480

Labor		No.	Hours	Rate	Total
operator		1	10	\$60.28	\$603
teamster (flatbed)		1	10	\$46.51	\$465
laborer		4	10	\$50.60	\$2,024
foreman		1	10	\$72.75	\$728
per diem	1 day	crew size:	7	\$125.00	\$875
Subtotal:					\$4,694

Material		Total			
allow \$ 2000 for topsoil, seed, fertilizer, straw bales, etc.		\$2,000			
Sales tax @ 8%		\$160			
Subtotal:					\$2,160

Total Direct Costs (3) = \$7,334

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. F. Restore well sites (continued)**

**Summary: Restore Well Sites**

A. Pipeline contractor costs	
1. Remove ROW fence and access work site	\$2,864
2. Remove gravel and miscellaneous debris	\$4,499
3. Restore site	<u>\$7,334</u>
Pipeline contractor direct costs:	\$14,698
5% Mobilization	<u>\$735</u>
Subtotal:	\$15,433
15% Contractor overhead:	<u>\$2,315</u>
Subtotal:	\$17,748
10% Contractor profit:	<u>\$1,775</u>
Total pipeline contractor costs:	<u>\$19,522</u>
B. Environmental contractor costs (5% of pipeline contractor costs)	
This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.	
	<u>\$976</u>
Total environmental contractor costs:	<u>\$976</u>
C. Pipeline company inspection costs	
1. Number of days per site	2.5
2. Company inspection cost per day	<u>\$500</u>
Total company inspection cost per site:	<u>\$1,250</u>
D. Pipeline company management and overhead costs (15% of A + B + C)	
	<u>\$3,262</u>
Total management and overhead cost:	<u>\$3,262</u>
Total cost to restore well site (A + B + C + D):	<u>\$25,011</u>
No. of well sites:	107
Total estimated cost to restore well sites:	<u>\$2,676,177</u>

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. Waverly Storage Field Retirement**

**G. Road crossings**

Description of Work:

Detailed cost estimate below reflects work required to retire a paved road or railroad crossing (100 feet) where pipeline diameter is greater than 12-inch. Work includes excavation and shoring of trench and road embankment, pulling pipe from casing as required, capping pipe ends, filling pipe with grout, backfilling and restoration of area. Estimate also includes environmental inspection, company inspection, and storage company management and overhead costs.

1. Remove ROW fence and access work sites (1/2 day)

Equipment	No.	Hours	Rate	Total
dozer, cat D-6	1	5	\$77.38	\$387
flatbed truck	1	5	\$21.96	\$110
3/4 ton pick-up with trailer	1	5	\$21.29	\$106
1/2 ton pickup with 4wd	2	5	\$9.11	\$91
small tools, 2% of labor				\$62
Subtotal:				\$756

Labor	No.	Hours	Rate	Total
operator	1	5	\$60.28	\$301
teamster	1	5	\$46.51	\$233
pipefitter/welder	1	5	\$71.30	\$356
helper	1	5	\$49.91	\$250
laborer	4	5	\$50.60	\$1,012
foreman	1	5	\$72.75	\$364
per diem	1/2 day	crew size:	9	\$125.00
Subtotal:				\$3,078

Material	Total
allow 2% of labor	\$62
Subtotal:	\$62

Total Direct Costs (1) = \$3,896

2. Excavate and cap pipe ends (1 day)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	1	10	\$66.81	\$668
flatbed truck	1	10	\$21.96	\$220
lowboy	1	10	\$50.97	\$510
3/4 ton pick-up with trailer	1	10	\$21.29	\$213
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$135
Subtotal:				\$1,927



**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. G. Road crossings (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator	1	10	\$60.28	\$603
teamster	2	10	\$46.51	\$930
pipefitter/welder	1	10	\$71.30	\$713
helper	1	10	\$49.91	\$499
laborer	4	10	\$50.60	\$2,024
foreman	1	10	\$72.75	\$728
per diem	1 day	crew size:	10	\$125.00
Subtotal:				\$6,747

Material	Total
allow 2% of labor	\$135
Subtotal:	\$135

Total Direct Costs (2) = \$8,809

3. Fill pipe or casing with grout, backfill trench, grade disturbed area (1 day)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	1	10	\$66.81	\$668
dump truck 8 cy	1	10	\$21.68	\$217
concrete pump trailer mounted 25 cy/hr	1	10	\$13.23	\$132
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$108
Subtotal:				\$1,307

Labor	No.	Hours	Rate	Total
operator	1	10	\$60.28	\$603
operator (grout pump)	1	10	\$58.39	\$584
teamster (dump)	1	10	\$46.51	\$465
laborer	4	10	\$50.60	\$2,024
foreman	1	10	\$72.75	\$728
per diem	1 day	crew size:	8	\$125.00
Subtotal:				\$5,403

Material	Total
Grout @ \$110/cy (estimate 10 cy)	\$1,100
Sales tax (8%)	\$88
Miscellaneous (2% of labor)	\$108
Subtotal:	\$1,296

Total Direct Costs (3) = \$8,007

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. G. Road crossings (continued)**

4. Restore sites (1/2 day)

Equipment	No.	Hours	Rate	Total
flatbed truck	1	5	\$21.96	\$110
1/2 ton pickup with 4wd	2	5	\$9.11	\$91
small tools, 2% of labor				\$40
			Subtotal:	\$241

Labor	No.	Hours	Rate	Total
teamster (flatbed)	1	5	\$46.51	\$233
laborer	4	5	\$50.60	\$1,012
foreman	1	5	\$72.75	\$364
per diem 1/2 day crew size:	6		\$125.00	\$375
			Subtotal:	\$1,983

Material	Total
allow \$ 1000 for topsoil, seed, fertilizer, straw bales, etc.	\$1,000
Sales tax (8%)	\$88
	Subtotal: \$1,088

Total Direct Costs (4) = \$3,312

**Summary: Road Crossings**

A. Pipeline contractor costs

1. Remove ROW fence and access work sites	\$3,896
2. Excavate and cap pipe ends	\$8,809
3. Fill pipe or casing with grout, backfill trench, grade disturbed area	\$8,007
4. Restore sites	\$3,312
Pipeline contractor direct costs:	\$24,023
5% Mobilization	\$1,201
Subtotal:	\$25,224
15% Contractor overhead:	\$3,784
Subtotal:	\$29,008
10% Contractor profit:	\$2,901
Total pipeline contractor costs:	\$31,909

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

\$1,595  
Total environmental contractor costs: \$1,595

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. G. Road crossings (continued)**

C. Pipeline company inspection costs

1. Number of days per site	3
2. Company cost per day	\$500
Total company inspection cost per site:	\$1,500

D. Pipeline company management and overhead costs (15% of A + B + C)

Total management and overhead cost:	\$5,251
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Total cost to retire road crossing (A + B + C + D): \$40,255

No. of road crossings: 6  
Total estimated cost to retire road crossings: \$241,530

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. Waverly Storage Field Retirement**

**H. Transite siding removal**

Description of Work:

Detailed cost estimate below reflects work required to remove transite siding from compressor station buildings.  
Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

**A. Remove transite siding (10 days)**

	Unit	No.	Unit Cost	Total
1. Compressor bldg #1 (44' x 148' x 30' height)	sf	11,520	\$3	\$34,560
2. Compressor bldg #2 (28' x 34' x 30' height)	sf	3,720	\$3	\$11,160
3. Compressor bldg #3 (34' x 49' x 30' height)	sf	4,980	\$3	\$14,940
4. Office/storage bldg (26' x 38' x 10' height)	sf	0	\$3	\$0
5. Office/control bldg (26' x 65' x 10' height)	sf	0	\$3	\$0
6. Shop & wh bldg (24' x 48' x 20' height)	sf	2,880	\$3	\$8,640
7. Regenerator bldg (24' x 30' x 20' height)	sf	2,160	\$3	\$6,480
8. Desulfurization bldg (20' x 30' x 20' height)	sf	2,000	\$3	\$6,000
9. Instrument bldg (6' x 18' x 10' height)	sf	0	\$3	\$0
Total siding removal contractor costs:				\$81,780

**B. Environmental contractor costs (5% of transite contractor costs)**

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

	\$4,089
Total environmental contractor costs:	\$4,089

**C. Storage company inspection costs**

1. Number of days per site	10
2. Company cost per day	\$500
Total company inspection cost per site:	\$5,000

**D. Storage company management and overhead costs (15% of A + B + C)**

	\$13,630
Total management and overhead cost:	\$13,630

Total estimated cost to remove transite siding (A + B + C + D) : \$104,499

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. Waverly Storage Field Retirement**

**I. Waverly compressor station**

Description of Work:

Detailed cost estimate below reflects work required to retire Waverly compressor station. Work includes removal of miscellaneous material, removal of valves, blowdowns, piping, equipment, compressor station buildings, meter runs, excavation of concrete foundations and gravel, and restoration of site. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead.

1. Remove miscellaneous material and access work site (2 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	1	20	\$66.81	\$1,336
flatbed truck	1	20	\$21.96	\$439
3/4 ton pick-up with trailer	1	20	\$21.29	\$426
1/2 ton pickup with 4wd	2	20	\$9.11	\$364
small tools, 2% of labor				\$246
Subtotal:				\$2,812

	Labor	No.	Hours	Rate	Total
operator		1	20	\$60.28	\$1,206
teamster		1	20	\$46.51	\$930
pipefitter/welder		1	20	\$71.30	\$1,426
helper		1	20	\$49.91	\$998
laborer		4	20	\$50.60	\$4,048
foreman		1	20	\$72.75	\$1,455
per diem	2 days	crew size:	9	\$125.00	\$2,250
				Subtotal:	\$12,313

Material	Total
allow 2% of labor	\$246
Subtotal:	\$246

Total Direct Costs (1) = \$15,371

2. Excavate, remove valves, blowdowns, meter runs and yard piping (15 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	2	150	\$66.81	\$20,043
bobcat	1	150	\$11.47	\$1,721
hydrocrane, Grove 30 ton	2	150	\$55.97	\$16,792
flatbed truck	2	150	\$21.96	\$6,587
lowboy	1	150	\$50.97	\$7,646
3/4 ton pick-up with trailer	4	150	\$21.29	\$12,776
1/2 ton pickup with 4wd	4	150	\$9.11	\$5,463
small tools, 2% of labor				\$5,147
Subtotal:				\$76,175

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. I. Waverly compressor station (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator (backhoe, bobcat)	3	150	\$60.28	\$27,128
operator (hydrocrane)	2	150	\$60.28	\$18,085
teamster	3	150	\$46.51	\$20,932
pipefitter/welder	4	150	\$71.30	\$42,778
helper	4	150	\$49.91	\$29,944
laborer	8	150	\$50.60	\$60,719
foreman	1	150	\$72.75	\$10,913
per diem	15 days	crew size:	25	\$125.00
Subtotal:				\$257,374

Material	Total
allow 2% of labor	\$5,147
Subtotal:	\$5,147

Total Direct Costs (2) = \$338,696

3. Remove station equipment (15 days)

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove 30 ton	2	150	\$55.97	\$16,792
hydrocrane, Grove 50 ton	1	150	\$102.59	\$15,389
flatbed truck	1	150	\$21.96	\$3,293
lowboy	1	150	\$50.97	\$7,646
3/4 ton pick-up with trailer	4	150	\$21.29	\$12,776
1/2 ton pickup with 4wd	4	150	\$9.11	\$5,463
small tools, 2% of labor				\$4,534
Subtotal:				\$65,893

Labor	No.	Hours	Rate	Total
operator (crane)	3	150	\$60.28	\$27,128
teamster	2	150	\$46.51	\$13,954
pipefitter/welder	4	150	\$71.30	\$42,778
helper	4	150	\$49.91	\$29,944
laborer	8	150	\$50.60	\$60,719
foreman	1	150	\$72.75	\$10,913
per diem	15 days	crew size:	22	\$125.00
Subtotal:				\$226,686

Material	Total
allow 2% of labor	\$4,534
Subtotal:	\$4,534

Total Direct Costs (3) = \$297,113

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. I. Waverly compressor station (continued)**

4. Remove station buildings (15 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B w grapple	2	150	\$74.07	\$22,220
hydrocrane, 30 ton	2	150	\$55.97	\$16,792
flatbed truck	2	150	\$21.96	\$6,587
lowboy	1	150	\$50.97	\$7,646
3/4 ton pick-up with trailer	4	150	\$21.29	\$12,776
1/2 ton pickup with 4wd	4	150	\$9.11	\$5,463
small tools, 2% of labor				\$4,929
Subtotal:				\$76,413

	Labor	No.	Hours	Rate	Total
operator		2	150	\$60.28	\$18,085
operator (hydrocrane)		2	150	\$60.28	\$18,085
teamster		3	150	\$46.51	\$20,932
pipefitter/welder		4	150	\$71.30	\$42,778
helper		4	150	\$49.91	\$29,944
laborer		8	150	\$50.60	\$60,719
foreman		1	150	\$72.75	\$10,913
per diem	15 days	crew size:	24	\$125.00	\$45,000
				Subtotal:	\$246,456

Material	Total
allow 2% of labor	\$4,929
Subtotal:	\$4,929

Total Direct Costs (4) = \$327,798

5. Demolish concrete foundations and compressor blocks to 2-ft below ground surface (15 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B w hammer	3	150	\$79.70	\$35,867
backhoe, Cat 325B	1	150	\$66.81	\$10,022
dump truck 14 cy	2	150	\$34.41	\$10,323
3/4 ton pick-up with trailer	4	150	\$21.29	\$12,776
1/2 ton pickup with 4wd	2	150	\$9.11	\$2,732
small tools, 2% of labor				\$3,995
Subtotal:				\$75,714

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. I. Waverly compressor station (continued)**

Line Item 5 (continued)

Labor	No.	Hours	Rate	Total
operator	4	150	\$60.28	\$36,170
teamster (dump)	2	150	\$46.51	\$13,954
pipefitter/welder	4	150	\$71.30	\$42,778
helper	4	150	\$49.91	\$29,944
laborer	4	150	\$50.60	\$30,359
foreman	1	150	\$72.75	\$10,913
per diem	15 days	crew size:	19	\$125.00
Subtotal:				\$35,625
				\$199,745

Material	Total
Miscellaneous (2% of labor)	\$3,995
Subtotal:	\$3,995

Total Direct Costs (5) = \$279,454

6. Restore site (5 days)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	1	50	\$77.38	\$3,869
motor grader, Cat 135-H	1	50	\$37.00	\$1,850
flatbed truck	1	50	\$21.96	\$1,098
1/2 ton pickup with 4wd	2	50	\$9.11	\$911
small tools, 2% of labor				\$542
Subtotal:				\$8,270

Labor	No.	Hours	Rate	Total
operator	2	50	\$60.28	\$6,028
teamster (flatbed)	1	50	\$46.51	\$2,326
laborer	4	50	\$50.60	\$10,120
foreman	1	50	\$72.75	\$3,638
per diem	5 days	crew size:	8	\$125.00
Subtotal:				\$5,000
				\$27,112

Material	Total
allow \$ 10000 for backfill, topsoil, seed, fertilizer, straw bales, etc.	\$10,000
Sales tax @ 8%	\$800
Subtotal:	\$10,800

Total Direct Costs (6) = \$46,181



**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**I. I. Waverly compressor station (continued)**

**Summary: Waverly Compressor Station**

A. Pipeline contractor costs		
1. Remove miscellaneous material and access work site		\$15,371
2. Excavate, remove valves, blowdowns, meter runs and yard piping		\$338,696
3. Remove station equipment		\$297,113
4. Remove station buildings		\$327,798
5. Demolish concrete foundation and compressor blocks to 2-ft below ground surface		\$279,454
6. Restore site		\$46,181
	Pipeline contractor direct costs:	\$1,304,613
	5% Mobilization	\$65,231
	Subtotal:	\$1,369,844
	15% Contractor overhead:	\$205,477
	Subtotal:	\$1,575,321
	10% Contractor profit:	\$157,532
	Total pipeline contractor costs:	\$1,732,853
B. Environmental contractor costs (5% of pipeline contractor costs)		
This section reflects work performed by environmental contractor to check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.		
		\$86,643
	Total environmental contractor costs:	\$86,643
C. Storage company inspection costs		
1. Number of days per site		67
2. Company cost per day		\$500
	Total company inspection cost per site:	\$33,500
D. Storage company management and overhead costs (15% of A + B + C)		
		\$277,949
	Total management and overhead cost:	\$277,949
Total cost to retire Waverly compressor station (A + B + C + D):		\$2,130,945

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**II. Salvage**

**A. Equipment**

- 1 Waverly compressor station

**Total equipment salvage:**

Estimated Salvage (2007\$)
(\$297,113)
(\$297,113)

**B. Scrap Steel**

- 1 Buildings

- a. Compressor bldg #3  
b. Compressor bldg #4  
c. Compressor bldg #5  
d. Shop & warehouse bldg  
e. Regenerator bldg  
f. Desulfurization bldg  
g. Instrument bldg

Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
500	(\$160)	(\$80,000)
75	(\$160)	(\$12,000)
75	(\$160)	(\$12,000)
50	(\$160)	(\$8,000)
50	(\$160)	(\$8,000)
10	(\$160)	(\$1,600)
5	(\$160)	(\$800)
Subtotal:		(\$122,400)

- 2 Pipe

- a. 4-inch pipe  
b. 6-inch pipe  
c. 8-inch pipe  
d. 10-inch pipe  
e. 12-inch pipe  
f. 14-inch pipe  
g. 16-inch pipe  
h. 18-inch pipe  
i. 20-inch pipe  
j. 22-inch pipe  
k. 24-inch pipe

Pipe Removed (ft)	Weight Per Foot (lbs)	Total Weight (lbs)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
10,731	10.79	115,787	58	(\$60)	(\$3,480)
5,248	18.97	99,555	50	(\$60)	(\$3,000)
13,650	24.70	337,155	169	(\$60)	(\$10,140)
1,462	34.24	50,059	25	(\$60)	(\$1,500)
5,047	43.77	220,907	110	(\$60)	(\$6,600)
0	54.57	0	0	(\$60)	\$0
24,642	62.58	1,542,096	771	(\$60)	(\$46,260)
0	82.15	0	0	(\$60)	\$0
0	104.13	0	0	(\$60)	\$0
0	114.81	0	0	(\$60)	\$0
10,797	140.68	1,518,922	759	(\$60)	(\$45,540)
Subtotal:					(\$116,520)

- 3 Well tubing

- a. 2-3/8 inch tubing

No. of Wells	Length Per Well (ft)	Weight Per Foot (lbs)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
54	1,784	3.65	176	(\$160)	(\$28,160)

- 4 Well site equipment

- a. Well head equipment  
b. Heaters

No. of Wells	Equipment Per Well (ton)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2006\$)
107	2	214	(\$160)	(\$34,240)
75	5	375	(\$160)	(\$60,000)
Subtotal:				(\$94,240)

**Total scrap steel salvage:**

(\$361,320)

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**Pipeline Contractor Labor Rates and Storage Company Inspection Cost**

A. Pipeline contractor labor rates

	(Note 1)	(Note 2)		(Note 3)		(Note 4)	
	Sept 2006		June 2007		June 2007	Labor	June 2007
	Labor Rate		Labor Rate		Labor Rate	Overhead	Labor Rate
	Including		Including		Adjusted	25% of	Pipeline
	Fringe	Escalation	Fringe	Overtime	for	June 2007	Demolition
	Benefits	Factor	Benefits	Factor	Overtime	Base Rate	Estimate
Trade	(\$/hr)		(\$/hr)		(\$/hr)	(\$/hr)	(\$/hr)
1 Operating engineers:							
2 Crane operator	\$41.33	1.02	\$42.16	1.18	\$49.74	\$10.54	\$60.28
3 Heavy equipment	\$41.33	1.02	\$42.16	1.18	\$49.74	\$10.54	\$60.28
4 Small equipment	\$40.03	1.02	\$40.83	1.18	\$48.18	\$10.21	\$58.39
5 Pipefitter/welder	\$48.88	1.02	\$49.86	1.18	\$58.83	\$12.46	\$71.30
6 Pipefitter/welder helper	\$34.22	1.02	\$34.90	1.18	\$41.18	\$8.73	\$49.91
7 Electrician	\$48.73	1.02	\$49.70	1.18	\$58.65	\$12.43	\$71.08
8 Electrician helper	\$34.11	1.02	\$34.79	1.18	\$41.06	\$8.70	\$49.75
9 Teamster	\$31.89	1.02	\$32.53	1.18	\$38.38	\$8.13	\$46.51
10 Laborer	\$34.69	1.02	\$35.38	1.18	\$41.75	\$8.85	\$50.60
11 Foreman	\$49.88	1.02	\$50.88	1.18	\$60.04	\$12.72	\$72.75
Labor overhead factor:	25%						
Per diem costs:	\$125						

B. Storage company inspection costs

	Estimated Cost per day
1 Pipeline and compressor station	\$500
2 Well P&A	\$1,000

Note: Inspection costs include direct labor, per diem, and transportation costs.

Notes

- Hourly union pay scales, September 2006, St. Louis, Missouri (ENR September 25, 2006).
- Escalation factor based on ENR construction cost indices September 2006 of 7763 and June 2007 of 7939 per ENR 6/4/07.
- Work 6-day week, 10-hr day. See workpapers for calculation of overtime factor.
- FICA, unemployment compensation, and workers compensation insurance that employers must pay.

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**Pipeline Contractor Equipment Rates**

Equipment Description	(Note 1)	(Note 2)	
	July 2005 Equipment Rate (\$/hr)	Escalation Factor	June 2007 Equipment Rate (\$/hr)
1 air compressor, 160 cfm with hose	\$13.32	1.07	\$14.25
2 paving breaker	\$0.69	1.07	\$0.74
3 concrete pump trailer mounted 25 cy/hr	\$12.36	1.07	\$13.23
4 concrete pump trailer mounted 67 cy/hr	\$51.41	1.07	\$55.01
5 crane, 25 ton, Grove hydrocrane 152 hp	\$46.47	1.07	\$49.72
6 crane, 30 ton, Grove hydrocrane 152 hp	\$52.31	1.07	\$55.97
7 crane, 50 ton, Grove hydrocrane 400 hp	\$95.88	1.07	\$102.59
8 motor grader, Cat 135-H, 135 hp	\$34.58	1.07	\$37.00
9 hydraulic excavator, Bobcat 53, 0.10 cy	\$10.72	1.07	\$11.47
10 hydraulic excavator, Cat 325B, 1.75 cy	\$62.44	1.07	\$66.81
11 hydraulic excavator, Cat 312C, 0.68 cy	\$28.47	1.07	\$30.46
12 hydraulic hammer, NPK, 1300-ft-lb	\$12.05	1.07	\$12.89
13 hydraulic grapple, Labounty 140 TW	\$6.78	1.07	\$7.25
14 lights, 6/1000W, 8 KW gen, trailer mtd.	\$5.34	1.07	\$5.71
15 pipelayer, Cat 561M, 18 ft boom, 40,000 lbs capacity	\$32.26	1.07	\$34.52
16 pipelayer, Cat 572R, 20 ft boom, 90,000 lbs capacity	\$61.38	1.07	\$65.68
17 tractor, Cat D-6R, 165 hp	\$72.32	1.07	\$77.38
18 winch for D-6R dozer	\$6.83	1.07	\$7.31
19 track loader, Cat 953C, 2.25 cy	\$46.20	1.07	\$49.43
20 dump truck 8 cy	\$20.26	1.07	\$21.68
21 dump truck 14 cy	\$32.16	1.07	\$34.41
22 flatbed truck	\$20.52	1.07	\$21.96
23 pipe truck	\$42.58	1.07	\$45.56
24 lowboy 50 ton	\$47.64	1.07	\$50.97
25 1/2 ton pickup, 4wd	\$8.51	1.07	\$9.11
26 3/4 ton pickup, 4wd	\$10.43	1.07	\$11.16
27 welder, trailer mounted, 45 hp	\$9.47	1.07	\$10.13

**Notes**

- Hourly Equipment Rates from July 2005, US Army Corps of Engineers Construction Equipment Ownership and Operating Expense Schedule, Region V.
- Escalation factor based on ENR construction cost indices July 2005 of 7422 and June 2007 of 7939 per ENR 3/19/07 and 6/4/07.

**Southwest Gas Storage Company  
Final Abandonment Estimate - Waverly Storage Field**

**Workpapers**

A. Overtime factor for six 10-hour days worked per week

	Hours Worked	Overtime Factor	Pay units
Straight-time 8 hours/day M-F	40	1	40
Overtime 2 hours/day M-F	10	1.5	15
Overtime Saturday first 8 hours	8	1.5	12
Overtime Saturday last 2 hours	2	2	4
Total:	60		71

Overtime factor: 1.18

B. Estimated number of environmental tests

	No. of Sites	Tests per Site	Total
1 Well sites	107	1	107
2 Compressor equipment	6	9	54
3 Miscellaneous @ 1 per 5000 sf	70	1	70
			231

C. Compressor equipment

	Engine	Rated HP
1	W-10	1100
2	W-3	550
3	W-4	550
4	W-5	1000
5	W-6	1000
6	W-8	1350
		5550

D. Field line mileage

Field Line Length (ft)	Field Line Length (mile)
71,577	13.56

**Southwest Gas Storage Company  
Final Abandonment Estimate**

**Borchers North Storage Field**  
(Location: Meade County, Kansas)

General Assumptions

1. Southwest Gas Storage final abandonment projects will be conducted independently.
2. Southwest Gas Storage management team will begin preparation for its Borchers North final abandonment two years prior to the scheduled abandonment. Southwest Gas Storage will manage and coordinate retirement activities prior to and during the actual retirement or hire a construction manager to perform these duties. Demolition work will be completed one year after work commences.
3. Southwest Gas Storage will file a FERC Section 7(b) abandonment application for the Borchers North abandonment project that will include a complete environmental report concerning the proposed final abandonment activities.
4. All above ground facilities will be removed and disturbed areas restored.
5. Field lines will be purged of hydrocarbons, cut in 40 foot sections, and removed.
6. All underground storage field injection/withdrawal and observation wells will be plugged and abandoned. Well head equipment and tubing will be salvaged.
7. Southwest Gas Storage will hire an environmental contractor to monitor retirement work and check for the presence of hazardous materials. Work will involve inspection, sampling, evaluation, and report writing. It is estimated that environmental contractor costs will be 5 percent of demolition contractor's costs.
8. Southwest Gas Storage inspection costs are estimated to be \$500 per day per inspector for pipeline and compressor station removal and \$1,000 per day per inspector for well P&A.
9. The estimated scrap value of carbon steel at Borchers North is \$160 per ton for steel free of asbestos and \$60 per ton for steel pipe with asbestos-contaminated coating. Salvage contractor will accept scrap at Borchers North and pay for transportation to salvage yard where material will be prepared for final salvage. Final preparation by the salvage contractor includes cutting material to proper size, cleaning tanks and vessels, removing pipe coating, etc.

10. The estimated gross salvage value of equipment assumes that equipment is at the end of its service life. Salvage contractor will accept equipment at Borchers North and pay for transportation to salvage yard where material will be prepared for final salvage.
11. No salvage allowance is included for underground storage field recoverable base gas.
12. ROW easements will revert back to deeded owners. ROW damages are estimated to be \$2 per foot. Legal fees and permit costs pertaining to ROW are included in management and overhead costs.
13. Abandonment costs are estimated in 2007 dollars.

**Southwest Gas Storage Company  
Final Abandonment Estimate**

**Borchers North Storage Field**  
(Location: Meade County, Kansas)

**Summary**

	Estimated Cost (2007\$)
<b>I. Borchers North Storage Field Retirement</b>	
A. Clean and purge	\$125,486
B. Remove field lines	\$3,203,874
C. Pipe handling and storage	\$383,171
D. Plug and abandon wells	\$2,208,956
E. Restore well sites	\$1,455,960
F. Road crossings	\$346,185
G. Borchers North compressor station	\$2,077,604
<b>Total I.</b>	<b>\$9,801,235</b>
<b>II. Salvage</b>	
A. Equipment	(\$288,531)
B. Scrap steel	(\$527,760)
<b>Total II.</b>	<b>(\$816,291)</b>
<b>III. Contingency</b> (10% of I above)	\$980,123
<b>Total III.</b>	<b>\$980,123</b>
<b>Grand Total:</b>	<b>\$9,965,067</b>



**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. Borchers North Storage Field Retirement**

**A. Clean and purge**

Description of Work:

Storage company personnel pig field lines and isolate field lines from wells and interconnects with compressor station. Abandonment pressure is assumed to be 150 psig. Storage company personnel blow down field lines to atmospheric pressure by flaring or venting. At this point field lines are filled with natural gas at atmospheric pressure. Storage company personnel then evacuate sections of pipe using pipeline evacuation equipment. At this point field lines are filled with air at atmospheric pressure. Storage company personnel blow down and evacuate compressor station. Storage field is ready for demolition work.

	Unit	No.	Days	Rate	Total
1 Pigging operation prior to final shutdown	person	2	23	\$1,000	\$46,000
2 Isolate field lines	person	2	2	\$1,000	\$4,000
3 Blowdown field lines	person	2	2	\$1,000	\$4,000
4 Pipeline evacuation	person	2	23	\$1,000	\$46,000
5 Compressor station blow down and evacuation	person	3	2	\$1,000	\$6,000
6 Gas loss in field lines (see note)	Mcf	2,939		\$6.63	\$19,486
				Total:	\$125,486

Note: Gas price per ICE Daily Indices, Panhandle pool gas price @ June 1, 2007

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. Borchers North Storage Field Retirement**

**B. Remove field lines**

Description of Work:

Detailed cost estimate below reflects work required to remove 20" diameter field line located in storage field. Work includes trench excavation, cutting pipe into 40-ft sections, loading pipe onto pipe trucks and hauling to temporary storage yard, backfilling trench, and restoration of area. Time to achieve each task is based on the removal of one mile of 20" dia. pipe. Removal costs are adjusted for pipe diameters greater than or less than 20". Estimate also includes environmental inspection, storage company inspection, ROW damages, and storage company management and overhead costs.

1. Excavate trench (1 day)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	1	10	\$77.38	\$774
backhoe, Cat 325B	4	10	\$66.81	\$2,672
flatbed truck	1	10	\$21.96	\$220
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$144
Subtotal:				\$3,992

	Labor	No.	Hours	Rate	Total
operator		5	10	\$58.07	\$2,903
teamster		1	10	\$49.88	\$499
laborer		4	10	\$49.53	\$1,981
foreman		1	10	\$72.89	\$729
per diem	1 day	crew size:	11	\$100.00	\$1,100
				Subtotal:	\$7,212

Material	Total
allow 2% of labor	\$144
Subtotal:	\$144

Total Direct Costs (1) = \$11,349

2. Remove pipe from trench, cut pipe, load on trucks, and haul to storage yard (1 day)

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove, 30 ton	1	10	\$55.97	\$560
pipelayer, Cat, 572-R, 20' boom	3	10	\$65.68	\$1,970
pipe truck	2	10	\$45.56	\$911
flatbed truck	1	10	\$21.96	\$220
lowboy	1	10	\$50.97	\$510
3/4 ton pick-up with trailer	4	10	\$21.29	\$852
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$280
Subtotal:				\$5,485

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. B. Remove field lines (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator (hydrocrane)	1	10	\$60.53	\$605
operator	3	10	\$58.07	\$1,742
teamster	4	10	\$49.88	\$1,995
pipefitter/welder	4	10	\$71.43	\$2,857
helper	4	10	\$50.00	\$2,000
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	21	\$100.00
Subtotal:				\$2,100
				\$14,010

Material	Total
allow 2% of labor	\$280
Subtotal:	\$280

Total Direct Costs (2) = \$19,775

3. Backfill trench (1 day)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	2	10	\$77.38	\$1,548
track loader, Cat 953C	1	10	\$49.43	\$494
dump truck 14 cy	5	10	\$34.41	\$1,721
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$165
Subtotal:				\$4,110

Labor	No.	Hours	Rate	Total
operator	3	10	\$58.07	\$1,742
teamster (dump)	5	10	\$49.88	\$2,494
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	13	\$100.00
Subtotal:				\$1,300
				\$8,246

Material	Total
Backfill material (600 cy @ \$10 per cy)	\$6,000
Sales tax (7%)	\$420
Miscellaneous (2% of labor)	\$165
Subtotal:	\$6,585

Total Direct Costs (3) = \$18,941

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. B. Remove field lines (continued)**

4. Restore Site (1 day)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	2	10	\$77.38	\$1,548
backhoe, Cat 325B	1	10	\$66.81	\$668
flatbed truck	2	10	\$21.96	\$439
dump truck 14 cy	2	10	\$34.41	\$688
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$153
Subtotal:				\$3,678

Labor	No.	Hours	Rate	Total
operator	3	10	\$58.07	\$1,742
teamster	4	10	\$49.88	\$1,995
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	12	\$100.00
Subtotal:				\$7,648

Material	Total
allow \$ 15,000 for topsoil, seed, fertilizer, straw bales, etc.	\$15,000
Sales tax @ 7%	\$1,050
Subtotal:	\$16,050

Total Direct Costs (4) = \$27,376

**Summary: Remove Field Lines**

A. Pipeline contractor costs	
1. Excavate trench	\$11,349
2. Remove pipe from trench, cut pipe, load on trucks, and haul to storage yard.	\$19,775
3. Backfill trench	\$18,941
4. Restore site	\$27,376
Pipeline contractor direct costs:	\$77,440
5% Mobilization	\$3,872
Subtotal:	\$81,312
15% Contractor overhead:	\$12,197
Subtotal:	\$93,509
10% Contractor profit:	\$9,351
Total pipeline contractor costs:	\$102,860

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. B. Remove field lines (continued)**

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

	\$5,143
Total environmental contractor costs:	\$5,143

C. Storage company inspection costs

1. Number of days per mile

2

2. Company cost per day

\$500

	\$1,000
Total company inspection cost per mile:	\$1,000

D. ROW damages at \$2 per foot

	\$10,560
Total ROW damage costs per mile:	\$10,560

E. Storage company management and overhead costs (15% of A + B + C + D)

	\$16,378
Total management and overhead cost:	\$16,378

Total estimated cost to remove 1 mile of 20" dia. field line (A + B + C + D + E):	\$135,941
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Estimated cost per foot to remove 1 mile of 20" dia. field line:	\$26
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**Total Estimated Cost to Remove Field Lines**

Pipeline Diameter (in.)	Pipeline Volume (cu. in.)	Six-Tenths Factor (See Note)	Estimated Removal Cost/ft	Pipeline Length (ft)	Estimated Removal Cost
4	12.6	0.2358	\$6	13,258	\$79,548
6	28.3	0.2358	\$6	9,331	\$55,986
8	50.3	0.3330	\$9	16,940	\$152,460
10	78.5	0.4353	\$11	20,952	\$230,472
12	113.1	0.5417	\$14	10,132	\$141,848
14	153.9	0.6518	\$17	0	\$0
16	201.1	0.7651	\$20	37,370	\$747,400
18	254.5	0.8812	\$23	0	\$0
20	314.2	1.0000	\$26	0	\$0
22	380.1	1.1212	\$29	0	\$0
24	452.4	1.2446	\$32	56,130	\$1,796,160
Total:				164,113	\$3,203,874

Note: For pipe less than 6-inch dia. use six-tenths factor for 6-inch dia pipe.

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. Borchers North Storage Field Retirement**

**C. Pipe handling and storage**

Description of Work:

Detailed cost estimate below reflects work required to unload pipe from pipe trucks, store pipe in temporary storage yard and load pipe onto carriers for transport to scap yard. Estimate is based on handling one mile of pipe per day. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

1. Unload pipe from pipe truck and stack in storage yard.

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove, 30 ton	1	10	\$55.97	\$560
1/2 ton pickup with 4wd	1	10	\$9.11	\$91
small tools, 2% of labor				\$54
Subtotal:				\$705

Labor	No.	Hours	Rate	Total
operator (hydrocrane)	1	10	\$60.53	\$605
laborer	2	10	\$49.53	\$991
foreman	1	10	\$72.89	\$729
per diem 1 day crew size:	4		\$100.00	\$400
Subtotal:				\$2,725

Material	Total
allow 2% of labor	\$54
Subtotal:	\$54

Total Direct Costs (1) = \$3,485

2. Load pipe in storage yard onto salvage contractor's carriers.

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove, 30 ton	1	10	\$55.97	\$560
1/2 ton pickup with 4wd	1	10	\$9.11	\$91
small tools, 2% of labor				\$54
Subtotal:				\$705

Labor	No.	Hours	Rate	Total
operator (hydrocrane)	1	10	\$60.53	\$605
laborer	2	10	\$49.53	\$991
foreman	1	10	\$72.89	\$729
per diem 1 day crew size:	4		\$100.00	\$400
Subtotal:				\$2,725

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. C. Pipe handling and storage (continued)**

Line Item 2 (continued)

Material	Total
allow 2% of labor	\$54
Subtotal:	\$54
Total Direct Costs (2) =	\$3,485

**Summary: Pipe handling and storage**

A. Pipeline contractor costs		
1. Unload pipe from pipe trucks and stack in storage yard.		\$3,485
2. Load pipe in storage yard onto contract carriers.		\$3,485
	Pipeline contractor direct costs:	\$6,969
	5% Mobilization	\$348
	Subtotal:	\$7,318
	15% Contractor overhead:	\$1,098
	Subtotal:	\$8,415
	10% Contractor profit:	\$842
	Total pipeline contractor costs:	\$9,257
B. Environmental contractor costs (5% of pipeline contractor costs)		
This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.		
		\$463
	Total environmental contractor costs:	\$463
C. Storage company inspection costs		
1. Number of days to unload and load per mile of pipe		2
2. Company cost per day		\$500
	Total company inspection cost per mile:	\$1,000
D. Storage company management and overhead costs (15% of A + B + C)		
		\$1,608
	Total management and overhead cost:	\$1,608
Total estimated cost to handle and store 1 mile of field line (A + B + C + D):		\$12,328
Estimated cost per foot to handle and store 1 mile of field line:		\$2.33

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. C. Pipe handling and storage (continued)**

**Total Estimated Pipe Handling and Storage Cost**

Pipeline Diameter (in.)	Estimated Cost/ft	Pipeline Length (ft)	Estimated Cost
4	\$2.33	13,258	\$30,955
6	\$2.33	9,331	\$21,786
8	\$2.33	16,940	\$39,551
10	\$2.33	20,952	\$48,919
12	\$2.33	10,132	\$23,656
14	\$2.33	0	\$0
16	\$2.33	37,370	\$87,251
18	\$2.33	0	\$0
20	\$2.33	0	\$0
22	\$2.33	0	\$0
24	\$2.33	56,130	\$131,052
Total:			\$383,171



**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. Borchers North Storage Field Retirement**

**D. Plug and abandon wells**

Description of Work:

Estimate below reflects work required to P&A injection/withdrawal and observation wells and remove above-ground well facilities. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

A. Plug and abandon wells

Unit	No.	Unit Cost	Total Cost
each	55	\$30,404	\$1,672,220
Subtotal:			\$1,672,220

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

	\$83,611
Total environmental contractor costs:	\$83,611

C. Storage company inspection costs

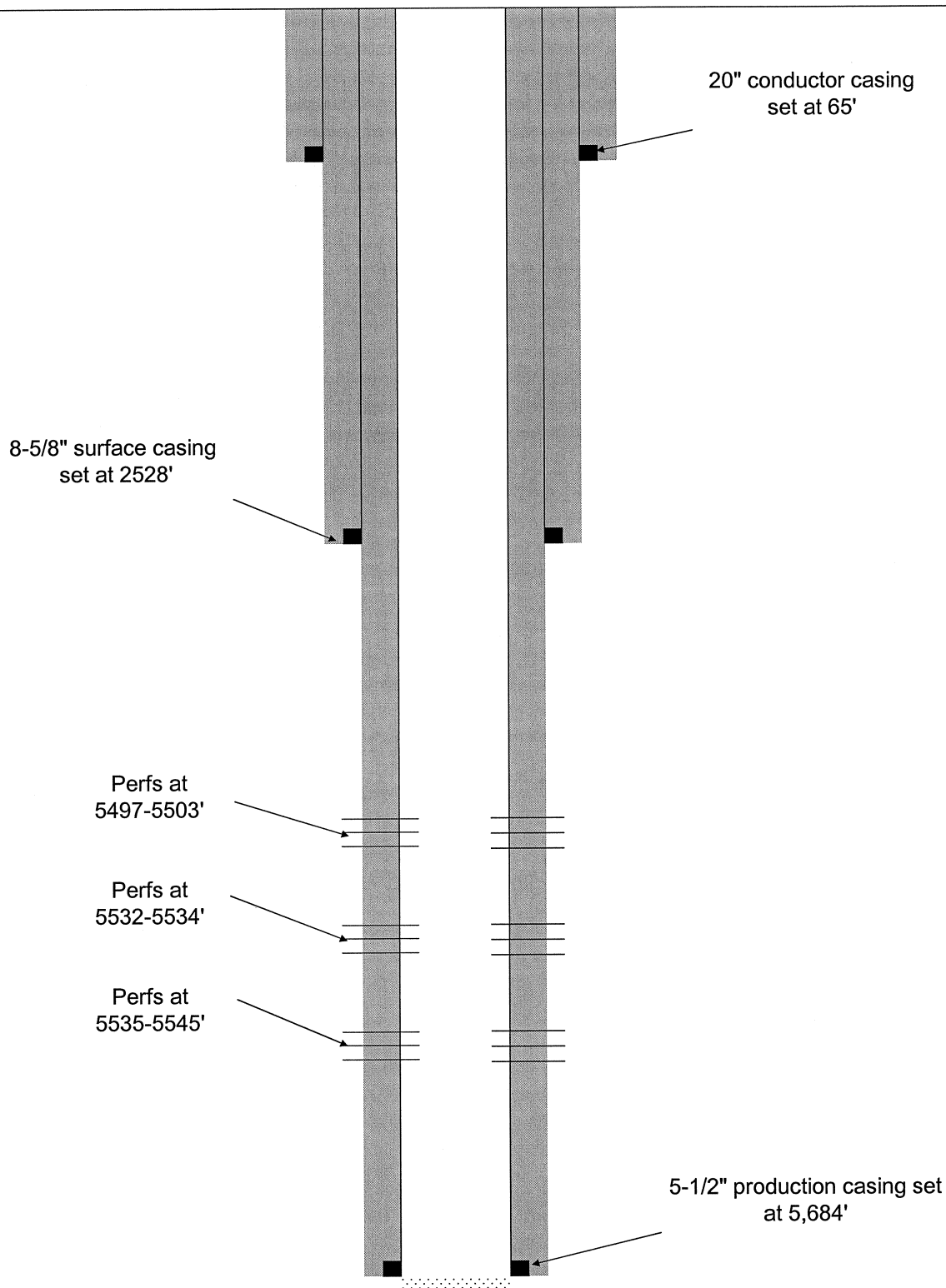
	No. of Wells	Days Per Well	Total No. of Days
1. Number of inspector days	55	3	165
2. Company cost per day			\$1,000
Total company inspection cost:			\$165,000

D. Storage company management and overhead costs (15% of A + B + C)

	\$288,125
Total management and overhead cost:	\$288,125

Total estimated cost to plug and abandon wells (A + B + C + D): \$2,208,956

Borchers North Storage Field - Typical Injection/Withdrawal Well Schematic



**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. Borchers North Storage Field Retirement**

**E. Restore well sites**

Description of Work:

Detailed cost estimate below reflects work required to restore a well site and access road. Work includes removal of ROW fence, excavation of crushed stone (approximately 200' x 50' x 1/2') and restoration of area. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

1. Remove ROW fence and access work site (1/2 day)

Equipment	No.	Hours	Rate	Total
Bobcat	1	5	\$11.47	\$57
flatbed truck	1	5	\$21.96	\$110
3/4 ton pick-up with trailer	1	5	\$21.29	\$106
1/2 ton pickup with 4wd	1	5	\$9.11	\$46
small tools, 2% of labor				\$47
Subtotal:				\$366

Labor	No.	Hours	Rate	Total
operator	1	5	\$58.07	\$290
teamster	1	5	\$49.88	\$249
pipefitter/welder	1	5	\$71.43	\$357
helper	1	5	\$50.00	\$250
laborer	2	5	\$49.53	\$495
foreman	1	5	\$72.89	\$364
per diem	1/2 day	crew size:	7	\$100.00
Subtotal:				\$2,357

Material	Total
allow 2% of labor	\$47
Subtotal:	\$47

Total Direct Costs (1) = \$2,770

2. Remove gravel and miscellaneous debris (1 day)

Equipment	No.	Hours	Rate	Total
track loader, Cat 953C	1	10	\$49.43	\$494
dump truck 14 cy	2	10	\$34.41	\$688
1/2 ton pickup with 4wd	1	10	\$9.11	\$91
small tools, 2% of labor				\$78
Subtotal:				\$1,352

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. E. Restore well sites (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator	1	10	\$58.07	\$581
teamster (dump)	2	10	\$49.88	\$998
laborer	2	10	\$49.53	\$991
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	6	\$100.00
Subtotal:				\$3,898

Material	Total
Miscellaneous (2% of labor)	\$78
Subtotal:	\$78

Total Direct Costs (2) = \$5,327

3. Restore site (1 day)

Equipment	No.	Hours	Rate	Total
motor grader, Cat 135-H	1	10	\$37.00	\$370
flatbed truck	1	10	\$21.96	\$220
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$90
Subtotal:				\$861

Labor	No.	Hours	Rate	Total
operator	1	10	\$58.07	\$581
teamster (flatbed)	1	10	\$49.88	\$499
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	7	\$100.00
Subtotal:				\$4,490

Material	Total
allow \$ 2000 for topsoil, seed, fertilizer, straw bales, etc.	\$2,000
Sales tax @ 7%	\$160
Subtotal:	\$2,160

Total Direct Costs (3) = \$7,511

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. E. Restore well sites (continued)**

**Summary: Restore Well Sites**

A. Pipeline contractor costs	
1. Remove ROW fence and access work site	\$2,770
2. Remove gravel and miscellaneous debris	\$5,327
3. Restore site	<u>\$7,511</u>
Pipeline contractor direct costs:	\$15,609
5% Mobilization	<u>\$780</u>
Subtotal:	\$16,389
15% Contractor overhead:	<u>\$2,458</u>
Subtotal:	\$18,848
10% Contractor profit:	<u>\$1,885</u>
Total pipeline contractor costs:	\$20,732
B. Environmental contractor costs (5% of pipeline contractor costs)	
This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.	
	<u>\$1,037</u>
Total environmental contractor costs:	\$1,037
C. Pipeline company inspection costs	
1. Number of days per site	2.5
2. Company inspection cost per day	<u>\$500</u>
Total company inspection cost per site:	\$1,250
D. Pipeline company management and overhead costs (15% of A + B + C)	
	<u>\$3,453</u>
Total management and overhead cost:	\$3,453
Total cost to restore well site (A + B + C + D):	\$26,472
No. of well sites:	55
Total estimated cost to restore well sites:	\$1,455,960

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. Borchers North Storage Field Retirement**

**F. Road crossings**

Description of Work:

Detailed cost estimate below reflects work required to retire a paved road or railroad crossing (100 feet) where pipeline diameter is greater than 12-inch. Work includes excavation and shoring of trench and road embankment, pulling pipe from casing as required, capping pipe ends, filling pipe with grout, backfilling and restoration of area. Estimate also includes environmental inspection, company inspection, and storage company management and overhead costs.

1. Remove ROW fence and access work sites (1/2 day)

Equipment	No.	Hours	Rate	Total
dozer, cat D-6	1	5	\$77.38	\$387
flatbed truck	1	5	\$21.96	\$110
3/4 ton pick-up with trailer	1	5	\$21.29	\$106
1/2 ton pickup with 4wd	2	5	\$9.11	\$91
small tools, 2% of labor				\$59
Subtotal:				\$753

Labor	No.	Hours	Rate	Total
operator	1	5	\$58.07	\$290
teamster	1	5	\$49.88	\$249
pipefitter/welder	1	5	\$71.43	\$357
helper	1	5	\$50.00	\$250
laborer	4	5	\$49.53	\$991
foreman	1	5	\$72.89	\$364
per diem	1/2 day	crew size:	9	\$100.00
			Subtotal:	\$2,952

Material	Total
allow 2% of labor	\$59
Subtotal:	\$59

Total Direct Costs (1) = \$3,764

2. Excavate and cap pipe ends (1 day)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	1	10	\$66.81	\$668
flatbed truck	1	10	\$21.96	\$220
lowboy	1	10	\$50.97	\$510
3/4 ton pick-up with trailer	1	10	\$21.29	\$213
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$130
Subtotal:				\$1,923

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. F. Road crossings (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator	1	10	\$58.07	\$581
teamster	2	10	\$49.88	\$998
pipefitter/welder	1	10	\$71.43	\$714
helper	1	10	\$50.00	\$500
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	10	\$100.00
Subtotal:				\$6,503

Material	Total
allow 2% of labor	\$130
Subtotal:	\$130

Total Direct Costs (2) = \$8,555

3. Fill pipe or casing with grout, backfill trench, grade disturbed areas (1 day)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	1	10	\$66.81	\$668
dump truck 8 cy	1	10	\$21.68	\$217
concrete pump trailer mounted 25 cy/hr	1	10	\$13.23	\$132
1/2 ton pickup with 4wd	2	10	\$9.11	\$182
small tools, 2% of labor				\$103
Subtotal:				\$1,302

Labor	No.	Hours	Rate	Total
operator	1	10	\$58.07	\$581
operator (grout pump)	1	10	\$56.55	\$565
teamster (dump)	1	10	\$49.88	\$499
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	8	\$100.00
Subtotal:				\$5,155

Material	Total
Grout @ \$76/cy (estimate 10 cy)	\$760
Sales tax (7%)	\$53
Miscellaneous (2% of labor)	\$103
Subtotal:	\$916

Total Direct Costs (3) = \$7,374

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. F. Road crossings (continued)**

4. Restore sites (1/2 day)

Equipment	No.	Hours	Rate	Total
flatbed truck	1	5	\$21.96	\$110
1/2 ton pickup with 4wd	2	5	\$9.11	\$91
small tools, 2% of labor				\$38
Subtotal:				\$239

Labor	No.	Hours	Rate	Total
teamster (flatbed)	1	5	\$49.88	\$249
laborer	4	5	\$49.53	\$991
foreman	1	5	\$72.89	\$364
per diem 1/2 day crew size:	6		\$100.00	\$300
Subtotal:				\$1,905

Material	Total
allow \$ 1000 for topsoil, seed, fertilizer, straw bales, etc.	\$1,000
Sales tax (7%)	\$70
Subtotal:	\$1,070

Total Direct Costs (4) = \$3,213

**Summary: Road Crossings**

A. Pipeline contractor costs

1. Remove ROW fence and access work sites	\$3,764
2. Excavate and cap pipe ends	\$8,555
3. Fill pipe or casing with grout, backfill trench, grade disturbed areas	\$7,374
4. Restore sites	\$3,213
Pipeline contractor direct costs:	\$22,907
5% Mobilization	\$1,145
Subtotal:	\$24,052
15% Contractor overhead:	\$3,608
Subtotal:	\$27,660
10% Contractor profit:	\$2,766
Total pipeline contractor costs:	\$30,426

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

	\$1,521
Total environmental contractor costs:	\$1,521



**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. F. Road crossings (continued)**

C. Pipeline company inspection costs

1. Number of days per site	3
2. Company cost per day	\$500
Total company inspection cost per site:	\$1,500

D. Pipeline company management and overhead costs (15% of A + B + C)

Total management and overhead cost:	\$5,017
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Total cost to retire road crossing (A + B + C + D): \$38,465

No. of road crossings: 9

Total estimated cost to retire road crossings: \$346,185

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. Borchers North Storage Field Retirement**

**H. Borchers North compressor station**

Description of Work:

Detailed cost estimate below reflects work required to retire Borchers North compressor station. Work includes removal of miscellaneous material, removal of valves, blowdowns, piping, equipment, compressor station buildings, meter runs, excavation of concrete foundations and gravel, and restoration of site. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead.

1. Remove miscellaneous material and access work site (2 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	1	20	\$66.81	\$1,336
flatbed truck	1	20	\$21.96	\$439
3/4 ton pick-up with trailer	1	20	\$21.29	\$426
1/2 ton pickup with 4wd	2	20	\$9.11	\$364
small tools, 2% of labor				\$236
Subtotal:				\$2,802

Labor			No.	Hours	Rate	Total
operator			1	20	\$58.07	\$1,161
teamster			1	20	\$49.88	\$998
pipefitter/welder			1	20	\$71.43	\$1,429
helper			1	20	\$50.00	\$1,000
laborer			4	20	\$49.53	\$3,963
foreman			1	20	\$72.89	\$1,458
per diem	2 days	crew size:	9		\$100.00	\$1,800
					Subtotal:	\$11,808

Material	Total
allow 2% of labor	\$236
Subtotal:	\$236

Total Direct Costs (1) = \$14,846

2. Excavate, remove valves, blowdowns, meter runs and yard piping (15 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	2	150	\$66.81	\$20,043
bobcat	1	150	\$11.47	\$1,721
hydrocrane, Grove 30 ton	2	150	\$55.97	\$16,792
flatbed truck	2	150	\$21.96	\$6,587
lowboy	1	150	\$50.97	\$7,646
3/4 ton pick-up with trailer	4	150	\$21.29	\$12,776
1/2 ton pickup with 4wd	4	150	\$9.11	\$5,463
small tools, 2% of labor				\$4,949
Subtotal:				\$75,977

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. H. Borchers North compressor station (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator (backhoe, bobcat)	3	150	\$58.07	\$26,130
operator (hydrocrane)	2	150	\$60.53	\$18,160
teamster	3	150	\$49.88	\$22,448
pipefitter/welder	4	150	\$71.43	\$42,857
helper	4	150	\$50.00	\$30,000
laborer	8	150	\$49.53	\$59,441
foreman	1	150	\$72.89	\$10,933
per diem	15 days	crew size:	25	\$100.00
Subtotal:				\$37,500
				\$247,468

Material	Total
allow 2% of labor	\$4,949
Subtotal:	\$4,949

Total Direct Costs (2) = \$328,394

3. Remove station equipment (15 days)

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove 30 ton	2	150	\$55.97	\$16,792
crane, Grove 50 ton	1	150	\$102.59	\$15,389
flatbed truck	1	150	\$21.96	\$3,293
lowboy	1	150	\$50.97	\$7,646
3/4 ton pick-up with trailer	4	150	\$21.29	\$12,776
1/2 ton pickup with 4wd	4	150	\$9.11	\$5,463
small tools, 2% of labor				\$4,369
Subtotal:				\$65,728

Labor	No.	Hours	Rate	Total
operator (crane)	3	150	\$60.53	\$27,239
teamster	2	150	\$49.88	\$14,965
pipefitter/welder	4	150	\$71.43	\$42,857
helper	4	150	\$50.00	\$30,000
laborer	8	150	\$49.53	\$59,441
foreman	1	150	\$72.89	\$10,933
per diem	15 days	crew size:	22	\$100.00
Subtotal:				\$33,000
				\$218,435

Material	Total
allow 2% of labor	\$4,369
Subtotal:	\$4,369

Total Direct Costs (3) = \$288,531

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. H. Borchers North compressor station (continued)**

4. Remove station buildings (15 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B w grapple	2	150	\$74.07	\$22,220
hydrocrane, 30 ton	2	150	\$55.97	\$16,792
flatbed truck	2	150	\$21.96	\$6,587
lowboy	1	150	\$50.97	\$7,646
3/4 ton pick-up with trailer	4	150	\$21.29	\$12,776
1/2 ton pickup with 4wd	4	150	\$9.11	\$5,463
small tools, 2% of labor				\$4,745
Subtotal:				\$76,229

Labor	No.	Hours	Rate	Total
operator	2	150	\$58.07	\$17,420
operator (hydrocrane)	2	150	\$60.53	\$18,160
teamster	3	150	\$49.88	\$22,448
pipefitter/welder	4	150	\$71.43	\$42,857
helper	4	150	\$50.00	\$30,000
laborer	8	150	\$49.53	\$59,441
foreman	1	150	\$72.89	\$10,933
per diem	15 days	crew size:	24	\$100.00
				\$36,000
Subtotal:				\$237,257

Material	Total
allow 2% of labor	\$4,745
Subtotal:	\$4,745

Total Direct Costs (4) = \$318,231

5. Demolish concrete foundations and compressor blocks to 2-ft below ground surface (15 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B w hammer	3	150	\$79.70	\$35,867
backhoe, Cat 325B	1	150	\$66.81	\$10,022
dump truck 14 cy	2	150	\$34.41	\$10,323
3/4 ton pick-up with trailer	4	150	\$21.29	\$12,776
1/2 ton pickup with 4wd	2	150	\$9.11	\$2,732
small tools, 2% of labor				\$3,836
Subtotal:				\$75,556

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. H. Borchers North compressor station (continued)**

Line Item 5 (continued)

Labor	No.	Hours	Rate	Total
operator	4	150	\$58.07	\$34,840
teamster (dump)	2	150	\$49.88	\$14,965
pipefitter/welder	4	150	\$71.43	\$42,857
helper	4	150	\$50.00	\$30,000
laborer	4	150	\$49.53	\$29,720
foreman	1	150	\$72.89	\$10,933
per diem	15 days	crew size:	19	\$100.00
Subtotal:				\$28,500
				\$191,815

Material	Total
Miscellaneous (2% of labor)	\$3,836
Subtotal:	\$3,836

Total Direct Costs (5) = \$271,207

6. Restore site (5 days)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	1	50	\$77.38	\$3,869
motor grader, Cat 135-H	1	50	\$37.00	\$1,850
flatbed truck	1	50	\$21.96	\$1,098
1/2 ton pickup with 4wd	2	50	\$9.11	\$911
small tools, 2% of labor				\$517
Subtotal:				\$8,245

Labor	No.	Hours	Rate	Total
operator	2	50	\$58.07	\$5,807
teamster (flatbed)	1	50	\$49.88	\$2,494
laborer	4	50	\$49.53	\$9,907
foreman	1	50	\$72.89	\$3,644
per diem	5 days	crew size:	8	\$100.00
Subtotal:				\$4,000
				\$25,852

Material	Total
allow \$ 15000 for backfill, topsoil, seed, fertilizer, straw bales, etc.	\$15,000
Sales tax @ 7%	\$1,050
Subtotal:	\$16,050

Total Direct Costs (6) = \$50,147

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**I. H. Borchers North compressor station (continued)**

**Summary: Borchers North Compressor Station**

<b>A. Pipeline contractor costs</b>	
1. Remove miscellaneous material and access work site	\$14,846
2. Excavate, remove valves, blowdowns, meter runs and yard piping	\$328,394
3. Remove station equipment	\$288,531
4. Remove station buildings	\$318,231
5. Demolish concrete foundation and compressor blocks to 2-ft below ground surface	\$271,207
6. Restore site	\$50,147
	<hr/>
Pipeline contractor direct costs:	\$1,271,356
5% Mobilization	\$63,568
	<hr/>
Subtotal:	\$1,334,923
	<hr/>
15% Contractor overhead:	\$200,239
	<hr/>
Subtotal:	\$1,535,162
	<hr/>
10% Contractor profit:	\$153,516
	<hr/>
Total pipeline contractor costs:	\$1,688,678
 <b>B. Environmental contractor costs (5% of pipeline contractor costs)</b>	
This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.	
	<hr/>
Total environmental contractor costs:	\$84,434
 <b>C. Storage company inspection costs</b>	
1. Number of days per site	67
2. Company cost per day	\$500
	<hr/>
Total company inspection cost per site:	\$33,500
 <b>D. Storage company management and overhead costs (15% of A + B + C)</b>	
	<hr/>
Total management and overhead cost:	\$270,992
	<hr/>
 Total cost to retire Borchers North compressor station (A + B + C + D):	 \$2,077,604

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**II. Salvage**

**A. Equipment**

	Estimated Salvage (2007\$)
1 Borchers North compressor station	(\$288,531)
<b>Total equipment salvage:</b>	<b>(\$288,531)</b>

**B. Scrap Steel**

	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
1 Buildings			
a. Compressor station	500	(\$160)	(\$80,000)
b. Auxilliary building	100	(\$160)	(\$16,000)
c. Office building	50	(\$160)	(\$8,000)
		Subtotal:	(\$104,000)

	Pipe Removed (ft)	Weight Per Foot (lbs)	Total Weight (lbs)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
2 Field lines						
a. 4-inch pipe	13,258	10.79	143,054	72	(\$60)	(\$4,320)
b. 6-inch pipe	9,331	18.97	177,009	89	(\$60)	(\$5,340)
c. 8-inch pipe	16,940	24.70	418,418	209	(\$60)	(\$12,540)
d. 10-inch pipe	20,952	34.24	717,396	359	(\$60)	(\$21,540)
e. 12-inch pipe	10,132	43.77	443,478	222	(\$60)	(\$13,320)
f. 14-inch pipe	0	54.57	0	0	(\$60)	\$0
g. 16-inch pipe	37,370	62.58	2,338,615	1169	(\$60)	(\$70,140)
h. 18-inch pipe	0	82.15	0	0	(\$60)	\$0
i. 20-inch pipe	0	104.13	0	0	(\$60)	\$0
j. 22-inch pipe	0	114.81	0	0	(\$60)	\$0
k. 24-inch pipe	56,130	140.68	7,896,368	3948	(\$60)	(\$236,880)
					Subtotal:	(\$364,080)

	No. of Wells	Length Per Well (ft)	Weight Per Foot (lbs)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
3 Well tubing						
a. 2-7/8 inch tubing	16	5,684	5.79	263	(\$160)	(\$42,080)

	No. of Wells	Equipment Per Well (ton)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
4 Well site equipment					
a. Well head equipment	55	2	110	(\$160)	(\$17,600)

**Total scrap steel salvage:** (\$527,760)

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**Pipeline Contractor Labor Rates and Storage Company Inspection Cost**

A Pipeline contractor labor rates

	(Note 1)	(Note 2)		(Note 3)		(Note 4)	
	Sept 2006		Mar 2007		Mar 2007	Labor	Mar 2007
	Labor Rate		Labor Rate		Labor Rate	Overhead	Labor Rate
	Including		Including		Adjusted	25% of	Pipeline
	Fringe	Escalation	Fringe	Overtime	for	June 2007	Demolition
	Benefits	Factor	Benefits	Factor	Overtime	Base Rate	Estimate
Trade	(\$/hr)		(\$/hr)		(\$/hr)	(\$/hr)	(\$/hr)
1 Operating engineers:							
2 Crane operator	\$41.50	1.02	\$42.33	1.18	\$49.95	\$10.58	\$60.53
3 Heavy equipment	\$39.81	1.02	\$40.61	1.18	\$47.92	\$10.15	\$58.07
4 Small equipment	\$38.77	1.02	\$39.55	1.18	\$46.66	\$9.89	\$56.55
5 Pipefitter/welder	\$48.97	1.02	\$49.95	1.18	\$58.94	\$12.49	\$71.43
6 Pipefitter/welder helper	\$34.28	1.02	\$34.96	1.18	\$41.26	\$8.74	\$50.00
7 Electrician	\$45.58	1.02	\$46.49	1.18	\$54.86	\$11.62	\$66.48
8 Electrician helper	\$31.91	1.02	\$32.54	1.18	\$38.40	\$8.14	\$46.54
9 Teamster	\$34.20	1.02	\$34.88	1.18	\$41.16	\$8.72	\$49.88
10 Laborer	\$33.96	1.02	\$34.64	1.18	\$40.87	\$8.66	\$49.53
11 Foreman	\$49.97	1.02	\$50.97	1.18	\$60.14	\$12.74	\$72.89
Labor overhead factor	25%						
Per diem:	\$100						

B. Storage company inspection costs

	Estimated Cost per day
1 Pipeline and compressor station	\$500
2 Well P&A	\$1,000

Note: Inspection costs include direct labor, per diem, and travel costs.

Notes

- Hourly union pay scales, September 2006, Kansas City, Missouri (ENR September 25, 2006).
- Escalation factor based on ENR construction cost indices September 2006 of 7763 and June 2007 of 7939 per ENR 6/4/07.
- Work 6-day week, 10-hr day. See workpapers for calculation of overtime factor.
- FICA, unemployment compensation, and workers compensation insurance that employers must pay.



**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**Pipeline Contractor Equipment Rates**

Equipment Description	(Note 1)	(Note 2)	
	July 2005 Equipment Rate (\$/hr)	Escalation Factor	June 2007 Equipment Rate (\$/hr)
1 air compressor, 160 cfm with hose	\$13.32	1.07	\$14.25
2 paving breaker	\$0.69	1.07	\$0.74
3 concrete pump trailer mounted 25 cy/hr	\$12.36	1.07	\$13.23
4 concrete pump trailer mounted 67 cy/hr	\$51.41	1.07	\$55.01
5 crane, 25 ton, Grove hydrocrane 152 hp	\$46.47	1.07	\$49.72
6 crane, 30 ton, Grove hydrocrane 152 hp	\$52.31	1.07	\$55.97
7 crane, 50 ton, Grove hydrocrane 400 hp	\$95.88	1.07	\$102.59
8 motor grader, Cat 135-H, 135 hp	\$34.58	1.07	\$37.00
9 hydraulic excavator, Bobcat 53, 0.10 cy	\$10.72	1.07	\$11.47
10 hydraulic excavator, Cat 325B, 1.75 cy	\$62.44	1.07	\$66.81
11 hydraulic excavator, Cat 312C, 0.68 cy	\$28.47	1.07	\$30.46
12 hydraulic hammer, NPK, 1300-ft-lb	\$12.05	1.07	\$12.89
13 hydraulic grapple, Labounty 140 TW	\$6.78	1.07	\$7.25
14 lights, 6/1000W, 8 KW gen, trailer mtd.	\$5.34	1.07	\$5.71
15 pipelayer, Cat 561M, 18 ft boom, 40,000 lbs capacity	\$32.26	1.07	\$34.52
16 pipelayer, Cat 572R, 20 ft boom, 90,000 lbs capacity	\$61.38	1.07	\$65.68
17 tractor, Cat D-6R, 165 hp	\$72.32	1.07	\$77.38
18 winch for D-6R dozer	\$6.83	1.07	\$7.31
19 track loader, Cat 953C, 2.25 cy	\$46.20	1.07	\$49.43
20 dump truck 8 cy	\$20.26	1.07	\$21.68
21 dump truck 14 cy	\$32.16	1.07	\$34.41
22 flatbed truck	\$20.52	1.07	\$21.96
23 pipe truck	\$42.58	1.07	\$45.56
24 lowboy 50 ton	\$47.64	1.07	\$50.97
25 1/2 ton pickup, 4wd	\$8.51	1.07	\$9.11
26 3/4 ton pickup, 4wd	\$10.43	1.07	\$11.16
27 welder, trailer mounted, 45 hp	\$9.47	1.07	\$10.13

Notes

- 1 Hourly Equipment Rates from July 2005, US Army Corps of Engineers Construction Equipment Ownership and Operating Expense Schedule, Region V.
- 2 Escalation factor based on ENR construction cost indices July 2005 of 7422 and June 2007 of 7939 per ENR 3/19/07 and 6/4/07.

**Southwest Gas Storage Company  
Final Abandonment Estimate - Borchers North Storage Field**

**Workpapers**

A. Overtime factor for six 10-hour days worked per week

	Hours Worked	Overtime Factor	Pay units
Straight-time 8 hours/day M-F	40	1	40
Overtime 2 hours/day M-F	10	1.5	15
Overtime Saturday first 8 hours	8	1.5	12
Overtime Saturday last 2 hours	2	2	4
Total:	60		71

Overtime factor: 1.18

B. Estimated number of environmental tests

	No. of Sites	Tests per Site	Total
1 Well sites	55	1	55
2 Compressor equipment	5	9	45
3 Miscellaneous @ 1 per 5000 sf	52	1	52
			152

C. Compressor equipment

	Engine	Rated HP
1		3000
2		3000
3		3000
4		3000
5		3000
		15000

D. Field line mileage

Field Line Length (ft)	Field Line Length (mile)
164,113	31.08

**Southwest Gas Storage Company  
Final Abandonment Estimate**

**North Hopeton Storage Field**  
(Location: Woods County, Oklahoma)

**General Assumptions**

1. Southwest Gas Storage final abandonment projects will be conducted independently.
2. Southwest Gas Storage management team will begin preparation for its North Hopeton final abandonment two years prior to the scheduled abandonment. Southwest Gas Storage will manage and coordinate retirement activities prior to and during the actual retirement or hire a construction manager to perform these duties. Demolition work will be completed one year after work commences.
3. Southwest Gas Storage will file a FERC Section 7(b) abandonment application for the North Hopeton abandonment project that will include a complete environmental report concerning the proposed final abandonment activities.
4. All above ground facilities will be removed and disturbed areas restored.
5. Field lines will be purged of hydrocarbons, cut in 40 foot sections, and removed.
6. All underground storage field injection/withdrawal, disposal, and observation wells will be plugged and abandoned. Well head equipment and tubing will be salvaged.
7. Southwest Gas Storage will hire an environmental contractor to monitor retirement work and check for the presence of hazardous materials. Work will involve inspection, sampling, evaluation, and report writing. It is estimated that environmental contractor costs will be 5 percent of demolition contractor's costs.
8. Southwest Gas Storage inspection costs are estimated to be \$500 per day per inspector for pipeline and compressor station removal and \$1,000 per day per inspector for well P&A.
9. The estimated scrap value of carbon steel at North Hopeton is \$160 per ton for steel free of asbestos and \$60 per ton for steel pipe with asbestos-contaminated coating. Salvage contractor will accept scrap at North Hopeton and pay for transportation to salvage yard where material will be prepared for final salvage. Final preparation by the salvage contractor includes cutting material to proper size, cleaning tanks and vessels, removing pipe coating, etc.

10. The estimated gross salvage value of equipment assumes that equipment is at the end of its service life. Salvage contractor will accept equipment at North Hopeton and pay for transportation to salvage yard where material will be prepared for final salvage.
11. No salvage allowance is included for underground storage field recoverable base gas.
12. ROW easements will revert back to deeded owners. ROW damages are estimated to be \$2 per foot. Legal fees and permit costs pertaining to ROW are included in management and overhead costs.
13. Abandonment costs are estimated in 2007 dollars.

**Southwest Gas Storage Company  
Final Abandonment Estimate**

**North Hopeton Storage Field**  
(Location: Woods County, Oklahoma)

**Summary**

	Estimated Cost (2007\$)
<b>I. North Hopeton Storage Field Retirement</b>	
A. Clean and purge	\$39,837
B. Remove field lines	\$242,392
C. Pipe handling and storage	\$80,046
D. Plug and abandon wells	\$1,032,778
E. Remove heaters	\$249,732
F. Restore well sites	\$524,160
G. Transite siding removal	\$18,538
H. North Hopeton compressor station	\$654,001
<b>Total I.</b>	<b>\$2,841,483</b>
<b>II. Salvage</b>	
A. Equipment	(\$88,687)
B. Scrap steel	(\$117,300)
<b>Total II.</b>	<b>(\$205,987)</b>
<b>III. Contingency</b> (10% of I above)	\$284,148
<b>Total III.</b>	<b>\$284,148</b>
<b>Grand Total:</b>	<b>\$2,919,644</b>

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. North Hopeton Storage Field Retirement**

**A. Clean and purge**

Description of Work:

Storage company personnel pig field lines and isolate field lines from wells and interconnects with compressor station. Abandonment pressure is assumed to be 525 psig. Storage company personnel blow down field lines to atmospheric pressure by flaring or venting. At this point field lines are filled with natural gas at atmospheric pressure. Storage company personnel then evacuate sections of pipe using pipeline evacuation equipment. At this point field lines are filled with air at atmospheric pressure. Storage company personnel blow down and evacuate compressor station. Storage field is ready for demolition work.

	Unit	No.	Days	Rate	Total
1 Pigging operation prior to final shutdown	person	2	7	\$1,000	\$14,000
2 Isolate field lines	person	2	1	\$1,000	\$2,000
3 Blowdown field lines	person	2	1	\$1,000	\$2,000
4 Pipeline evacuation	person	2	7	\$1,000	\$14,000
5 Compressor station blow down and evacuation	person	3	2	\$1,000	\$6,000
6 Gas loss in field lines (see note)	Mcf	277		\$6.63	\$1,837
				Total:	\$39,837

Note: Gas price per ICE Daily Indices, Panhandle pool gas price @ June 1, 2007

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. North Hopeton Storage Field Retirement**

**B. Remove field lines**

Description of Work:

Detailed cost estimate below reflects work required to remove 20" diameter field line located in storage field. Work includes trench excavation, cutting pipe into 40-ft sections, loading pipe onto pipe trucks and hauling to temporary storage yard, backfilling trench, and restoration of area. Time to achieve each task is based on the removal of one mile of 20" dia. pipe. Removal costs are adjusted for pipe diameters greater than or less than 20". Estimate also includes environmental inspection, storage company inspection, ROW damage payments, and storage company management and overhead costs.

1. Excavate trench (1 day)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	1	10	\$71.16	\$712
backhoe, Cat 325B	4	10	\$61.97	\$2,479
flatbed truck	1	10	\$20.37	\$204
1/2 ton pickup with 4wd	2	10	\$8.70	\$174
small tools, 2% of labor				\$144
Subtotal:				\$3,712

Labor	No.	Hours	Rate	Total
operator	5	10	\$58.07	\$2,903
teamster	1	10	\$49.88	\$499
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem 1 day crew size:	11		\$100.00	\$1,100
Subtotal:				\$7,212

Material	Total
allow 2% of labor	\$144
Subtotal:	\$144

Total Direct Costs (1) = \$11,069

2. Remove pipe from trench, cut pipe, load on trucks, and haul to storage yard (1 day)

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove, 30 ton	1	10	\$52.50	\$525
pipelayer, Cat, 572-R, 20' boom	3	10	\$60.80	\$1,824
pipe truck	2	10	\$42.18	\$844
flatbed truck	1	10	\$20.37	\$204
lowboy	1	10	\$47.24	\$472
3/4 ton pick-up with trailer	4	10	\$20.44	\$817
1/2 ton pickup with 4wd	2	10	\$8.70	\$174
small tools, 2% of labor				\$280
Subtotal:				\$5,140

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. B. Remove field lines (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator (hydrocrane)	1	10	\$60.53	\$605
operator	3	10	\$58.07	\$1,742
teamster	4	10	\$49.88	\$1,995
pipefitter/welder	4	10	\$71.43	\$2,857
helper	4	10	\$50.00	\$2,000
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	21	\$100.00
Subtotal:				\$2,100
				\$14,010

Material	Total
allow 2% of labor	\$280
Subtotal:	\$280

Total Direct Costs (2) = \$19,431

3. Backfill trench (1 day)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	2	10	\$71.16	\$1,423
track loader, Cat 953C	1	10	\$45.52	\$455
dump truck 14 cy	5	10	\$31.79	\$1,589
1/2 ton pickup with 4wd	2	10	\$8.70	\$174
small tools, 2% of labor				\$165
Subtotal:				\$3,807

Labor	No.	Hours	Rate	Total
operator	3	10	\$58.07	\$1,742
teamster (dump)	5	10	\$49.88	\$2,494
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	13	\$100.00
Subtotal:				\$1,300
				\$8,246

Material	Total
Backfill material (600 cy @ \$10 per cy)	\$6,000
Sales tax (8%)	\$480
Miscellaneous (2% of labor)	\$165
Subtotal:	\$6,645

Total Direct Costs (3) = \$18,698



**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. B. Remove field lines (continued)**

4. Restore site (1 day)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	2	10	\$71.16	\$1,423
backhoe, Cat 325B	1	10	\$61.97	\$620
flatbed truck	2	10	\$20.37	\$407
dump truck 14 cy	2	10	\$31.79	\$636
1/2 ton pickup with 4wd	2	10	\$8.70	\$174
small tools, 2% of labor				\$153
Subtotal:				\$3,413

Labor	No.	Hours	Rate	Total
operator	3	10	\$58.07	\$1,742
teamster	4	10	\$49.88	\$1,995
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	12	\$100.00
Subtotal:				\$7,648

Material	Total
allow \$ 15,000 for topsoil, seed, fertilizer, straw bales, etc.	\$15,000
Sales tax @ 8%	\$1,200
Subtotal:	\$16,200

Total Direct Costs (4) = \$27,261

**Summary: Remove Field Lines**

A. Pipeline contractor costs	
1. Excavate trench	\$11,069
2. Remove pipe from trench, cut pipe, load on trucks, and haul to storage yard	\$19,431
3. Backfill trench	\$18,698
4. Restore site	\$27,261
Pipeline contractor direct costs:	\$76,458
5% Mobilization	\$3,823
Subtotal:	\$80,281
15% Contractor overhead:	\$12,042
Subtotal:	\$92,323
10% Contractor profit:	\$9,232
Total pipeline contractor costs:	\$101,556

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. B. Remove field lines (continued)**

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

Total environmental contractor costs: \$5,078  
\$5,078

C. Storage company inspection costs

1. Number of days per mile

2

2. Company cost per day

\$500

Total company inspection cost per mile: \$1,000

D. ROW damages @ \$2 per foot

Total ROW damage costs per mile: \$10,560

E. Storage company management and overhead costs (15% of A + B + C + D)

Total management and overhead cost: \$16,172  
\$16,172

Total estimated cost to remove 1 mile of 20" dia. field line (A + B + C + D): \$134,366

Estimated cost per foot to remove 1 mile of 20" dia. field line: \$25

**Total Estimated Cost to Remove Field Lines**

Pipeline Diameter (in.)	Pipeline Volume (cu. in.)	Six-Tenths Factor (See Note)	Estimated Removal Cost/ft	Pipeline Length (ft)	Estimated Removal Cost
4	12.6	0.2358	\$6	17,703	\$106,218
6	28.3	0.2358	\$6	1,885	\$11,310
8	50.3	0.3330	\$8	15,608	\$124,864
10	78.5	0.4353	\$11	0	\$0
12	113.1	0.5417	\$14	0	\$0
14	153.9	0.6518	\$16	0	\$0
16	201.1	0.7651	\$19	0	\$0
18	254.5	0.8812	\$22	0	\$0
20	314.2	1.0000	\$25	0	\$0
22	380.1	1.1212	\$28	0	\$0
24	452.4	1.2446	\$31	0	\$0
Total:				35,196	\$242,392

Note: For pipe less than 6-inch dia. use six-tenths factor for 6-inch dia pipe.

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. North Hopeton Storage Field Retirement**

**C. Pipe handling and storage**

Description of Work:

Detailed cost estimate below reflects work required to unload pipe from pipe trucks, store pipe in temporary storage yard, and load pipe onto carriers for transport to scap yard. Estimate is based on handling one mile of pipe per day. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

1. Unload pipe from pipe truck and stack in storage yard.

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove, 25 ton	1	10	\$46.42	\$464
1/2 ton pickup with 4wd	1	10	\$8.70	\$87
small tools, 2% of labor				\$54
Subtotal:				\$606

Labor	No.	Hours	Rate	Total
operator (hydrocrane)	1	10	\$60.53	\$605
laborer	2	10	\$49.53	\$991
foreman	1	10	\$72.89	\$729
per diem 1 day crew size:	4		\$100.00	\$400
Subtotal:				\$2,725

Material	Total
allow 2% of labor	\$54
Subtotal:	\$54

Total Direct Costs (1) = \$3,385

2. Load pipe in storage yard onto salvage contractor's carriers.

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove, 25 ton	1	10	\$46.42	\$464
1/2 ton pickup with 4wd	1	10	\$8.70	\$87
small tools, 2% of labor				\$54
Subtotal:				\$606

Labor	No.	Hours	Rate	Total
operator (hydrocrane)	1	10	\$60.53	\$605
laborer	2	10	\$49.53	\$991
foreman	1	10	\$72.89	\$729
per diem 1 day crew size:	4		\$100.00	\$400
Subtotal:				\$2,725

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. C. Pipe handling and storage (continued)**

Line Item 2 (continued)

Material	Total
allow 2% of labor	\$54
Subtotal:	\$54
Total Direct Costs (2) =	\$3,385

**Summary: Pipe handling and storage**

A. Pipeline contractor costs	
1. Unload pipe from pipe trucks and stack in storage yard	\$3,385
2. Load pipe in storage yard onto contract carriers	\$3,385
Pipeline contractor direct costs:	\$6,770
5% Mobilization	\$339
Subtotal:	\$7,109
15% Contractor overhead:	\$1,066
Subtotal:	\$8,175
10% Contractor profit:	\$817
Total pipeline contractor costs:	\$8,992
B. Environmental contractor costs (5% of pipeline contractor costs)	
This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.	
Total environmental contractor costs:	\$450
C. Storage company inspection costs	
1. Number of days per mile of pipe to unload and load pipe	2
2. Company cost per day	\$500
Total company inspection cost per mile:	\$1,000
D. Storage company management and overhead costs (15% of A + B + C)	
Total management and overhead cost:	\$1,566
Total estimated cost to handle and store 1 mile of field line (A + B + C + D):	\$12,008
Estimated cost per foot to handle and store 1 mile of field line:	\$2.27

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. C. Pipe handling and storage (continued)**

**Total Estimated Pipe Handling and Storage Cost**

Pipeline Diameter (in.)	Estimated Cost/ft	Pipeline Length (ft)	Estimated Cost
4	\$2.27	17,703	\$40,262
6	\$2.27	1,885	\$4,287
8	\$2.27	15,608	\$35,497
10	\$2.27	0	\$0
12	\$2.27	0	\$0
14	\$2.27	0	\$0
16	\$2.27	0	\$0
18	\$2.27	0	\$0
20	\$2.27	0	\$0
22	\$2.27	0	\$0
24	\$2.27	0	\$0
Total:			\$80,046

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. North Hopeton Storage Field Retirement**

**D. Plug and abandon wells**

Description of Work:

Estimate below reflects work required to P&A injection/withdrawal, observation, and salt water disposal wells.  
Estimate also includes environmental inspection, storage company inspection and storage company overhead costs.

A. Plug and abandon wells

Unit	No.	Unit Cost	Total Cost
each	20	\$39,908	\$798,160
Subtotal:			\$798,160

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

	\$39,908
Total environmental contractor costs:	\$39,908

C. Storage company inspection costs

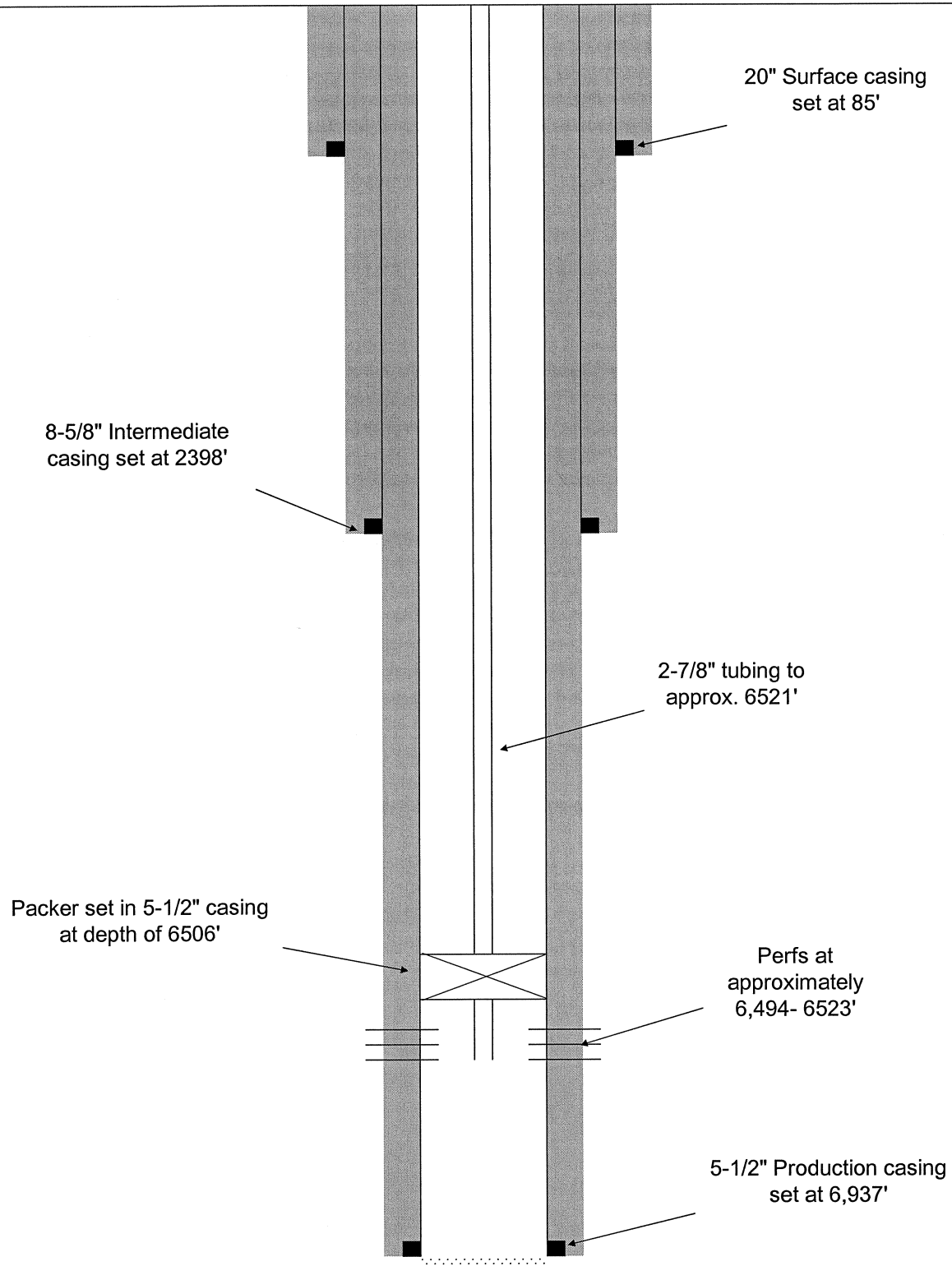
	No. of Wells	Days Per Well	Total No. of Days
1. Number of inspector days	20	3	60
2. Company cost per day			\$1,000
Total company inspection cost:			\$60,000

D. Storage company management and overhead costs (15% of A + B + C)

	\$134,710
Total management and overhead cost:	\$134,710

Total estimated cost to plug and abandon wells (A + B + C + D): \$1,032,778

North Hopeton Storage Field - Typical Injection/Withdrawal Well Schematic



**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. North Hopeton Storage Field Retirement**

**E. Remove heaters**

Description of Work:

Detailed estimate below reflects work required to remove well head heaters and piping. Work includes removing heaters, piping, and concrete piers. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

1. Remove heater and piping (1 day)

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove 30 ton	1	10	\$52.50	\$525
backhoe, Cat 312C	1	10	\$28.32	\$283
flatbed truck	1	10	\$20.37	\$204
lowboy	1	10	\$47.24	\$472
3/4 ton pick-up with trailer	1	10	\$20.44	\$204
1/2 ton pickup with 4wd	1	10	\$8.70	\$87
small tools, 2% of labor				\$120
Subtotal:				\$1,896

Labor	No.	Hours	Rate	Total
operator (crane)	1	10	\$60.53	\$605
operator (backhoe)	1	10	\$58.07	\$581
teamster	2	10	\$49.88	\$998
pipefitter/welder	1	10	\$71.43	\$714
helper	1	10	\$50.00	\$500
laborer	2	10	\$49.53	\$991
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	9	\$100.00
Subtotal:				\$6,017

Material	Total
allow 2% of labor	\$120
Subtotal:	\$120

Total Direct Costs (1) = \$8,034

2. Remove concrete piers (1/2 day)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 312C	1	5	\$28.32	\$142
flatbed truck	1	5	\$20.37	\$102
lowboy	1	5	\$47.24	\$236
1/2 ton pickup with 4wd	1	5	\$8.70	\$43
small tools, 2% of labor				\$39
Subtotal:				\$562



**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. E. Remove heaters (continued)**

Line Item 2 (continued)

Labor		No.	Hours	Rate	Total
operator		1	5	\$58.07	\$290
teamster		2	5	\$49.88	\$499
laborer		2	5	\$49.53	\$495
foreman		1	5	\$72.89	\$364
per diem	1/2 day	6		\$100.00	\$300
Subtotal:					\$1,949

Material		Total
allow 2% of labor		\$39
Subtotal:		\$39

Total Direct Costs (2) = \$2,550

A. Pipeline contractor costs

1. Remove heater and piping	\$8,034
2. Remove concrete piers	\$2,550
Pipeline contractor direct costs:	\$10,584
5% Mobilization	\$529
Subtotal:	\$11,113
15% Contractor overhead:	\$1,667
Subtotal:	\$12,780
10% Contractor profit:	\$1,278
Total pipeline contractor costs:	\$14,058

B. Environmental contractor costs (5% of pipeline contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.	
	\$703
Total environmental contractor costs:	\$703

C. Storage company inspection costs

1. Number of days to remove heaters	1.5
2. Company cost per day	\$500
Total company inspection cost per mile:	\$750

D. Storage company management and overhead costs (15% of A + B + C)

	\$2,327
Total management and overhead cost:	\$2,327

Total cost to remove heaters (A + B + C + D): \$17,838  
No. of well sites: 14  
Total estimated cost to remove heaters: \$249,732

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. North Hopeton Storage Field Retirement**

**F. Restore well sites**

Description of Work:

Detailed cost estimate below reflects work required to restore a well site and access road. Work includes removal of ROW fence, excavation of crushed stone (approximately 200' x 50' x 1/2') and restoration of area. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

1. Remove ROW fence and access work site (1/2 day)

Equipment	No.	Hours	Rate	Total
bobcat	1	5	\$10.66	\$53
flatbed truck	1	5	\$20.37	\$102
3/4 ton pick-up with trailer	1	5	\$20.44	\$102
1/2 ton pickup with 4wd	1	5	\$8.70	\$43
small tools, 2% of labor				\$47
Subtotal:				\$348

Labor	No.	Hours	Rate	Total
operator	1	5	\$58.07	\$290
teamster	1	5	\$49.88	\$249
pipefitter/welder	1	5	\$71.43	\$357
helper	1	5	\$50.00	\$250
laborer	2	5	\$49.53	\$495
foreman	1	5	\$72.89	\$364
per diem	1/2 day	crew size:	7	\$100.00
Subtotal:				\$2,357

Material	Total
allow 2% of labor	\$47
Subtotal:	\$47

Total Direct Costs (1) = \$2,752

2. Remove gravel and miscellaneous debris (1 day)

Equipment	No.	Hours	Rate	Total
track loader, Cat 953C	1	10	\$45.52	\$455
dump truck 14 cy	2	10	\$31.79	\$636
1/2 ton pickup with 4wd	1	10	\$8.70	\$87
small tools, 2% of labor				\$78
Subtotal:				\$1,256

**Southwest Gas Storage Company**  
**Final Abandonment Estimate - North Hopeton Storage Field**

**I. F. Restore well sites (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator	1	10	\$58.07	\$581
teamster (dump)	2	10	\$49.88	\$998
laborer	2	10	\$49.53	\$991
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size: 6	\$100.00	\$600
Subtotal:				\$3,898

Material	Total
Miscellaneous (2% of labor)	\$78
Subtotal:	\$78

Total Direct Costs (2) = \$5,232

3. Restore site (1 day)

Equipment	No.	Hours	Rate	Total
motor grader, Cat 135-H	1	10	\$34.37	\$344
flatbed truck	1	10	\$20.37	\$204
1/2 ton pickup with 4wd	2	10	\$8.70	\$174
small tools, 2% of labor				\$90
Subtotal:				\$811

Labor	No.	Hours	Rate	Total
operator	1	10	\$58.07	\$581
teamster (flatbed)	1	10	\$49.88	\$499
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size: 7	\$100.00	\$700
Subtotal:				\$4,490

Material	Total
allow \$ 2000 for topsoil, seed, fertilizer, straw bales, etc.	\$2,000
Sales tax @ 8%	\$160
Subtotal:	\$2,160

Total Direct Costs (3) = \$7,461

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. F. Restore well sites (continued)**

**Summary: Restore Well Sites**

A. Pipeline contractor costs		
1. Remove ROW fence and access work site		\$2,752
2. Remove gravel and miscellaneous debris		\$5,232
3. Restore site		\$7,461
	Pipeline contractor direct costs:	\$15,444
	5% Mobilization	\$772
	Subtotal:	\$16,217
	15% Contractor overhead:	\$2,433
	Subtotal:	\$18,649
	10% Contractor profit:	\$1,865
	Total pipeline contractor costs:	\$20,514
B. Environmental contractor costs (5% of pipeline contractor costs)		
This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.		
		\$1,026
	Total environmental contractor costs:	\$1,026
C. Pipeline company inspection costs		
1. Number of days per site		2.5
2. Company inspection cost per day		\$500
	Total company inspection cost per site:	\$1,250
D. Pipeline company management and overhead costs (15% of A + B + C)		
		\$3,418
	Total management and overhead cost:	\$3,418
Total cost to restore well sites (A + B + C + D):		\$26,208
No. of well sites:		20
Total estimated cost to restore well sites:		\$524,160

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. North Hopeton Storage Field Retirement**

**G. Transite siding removal**

Description of Work:

Detailed cost estimate below reflects work required to remove transite siding from storage company's portion of North Hopeton compressor building. Estimate also includes environmental inspection, storage company inspection and storage company management and overhead costs.

A. Remove transite siding (2 days)

	Unit	No.	Unit Cost	Total
Compressor station building (60'x40')	sf	4,800	\$3	\$14,400
(60'+60'+40') perimeter x 30' height				
		Total transite contractor costs:		\$14,400

B. Environmental contractor costs (5% of transite contractor costs)

This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.

	\$720
Total environmental contractor costs:	\$720

C. Storage company inspection costs

1. Number of days per site	2
2. Company cost per day	\$500
Total company inspection cost per site:	\$1,000

D. Storage company management and overhead costs (15% of A + B + C)

	\$2,418
Total management and overhead cost:	\$2,418

Total estimated cost to remove transite siding (A + B + C + D): \$18,538

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. North Hopeton Storage Field Retirement**

**H. North Hopeton compressor station**

Description of Work:

Detailed cost estimate below reflects work required to retire storage company's portion of North Hopeton compressor station. Work includes removal of miscellaneous material, excavation, removal of valves, blowdowns, piping and equipment, removal of compressor building, excavation of concrete foundations, excavation of gravel surface and restoration of site. Estimate also includes environmental inspection, storage company inspection, and storage company management and overhead costs.

1. Remove miscellaneous material and access work site (1 day)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	1	10	\$61.97	\$620
flatbed truck	1	10	\$20.37	\$204
3/4 ton pick-up with trailer	1	10	\$20.44	\$204
1/2 ton pickup with 4wd	2	10	\$8.70	\$174
small tools, 2% of labor				\$118
Subtotal:				\$1,320

Labor	No.	Hours	Rate	Total
operator	1	10	\$58.07	\$581
teamster	1	10	\$49.88	\$499
pipefitter/welder	1	10	\$71.43	\$714
helper	1	10	\$50.00	\$500
laborer	4	10	\$49.53	\$1,981
foreman	1	10	\$72.89	\$729
per diem	1 day	crew size:	\$100.00	\$900
				\$5,904

Material	Total
allow 2% of labor	\$118
Subtotal:	\$118
Total Direct Costs (1) =	\$7,342

2. Excavate, remove valves, blowdowns and yard piping (5 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B	2	50	\$61.97	\$6,197
bobcat	1	50	\$10.66	\$533
hydrocrane, Grove 30 ton	2	50	\$52.50	\$5,250
flatbed truck	2	50	\$20.37	\$2,037
lowboy	1	50	\$47.24	\$2,362
3/4 ton pick-up with trailer	4	50	\$20.44	\$4,087
1/2 ton pickup with 4wd	4	50	\$8.70	\$1,740
small tools, 2% of labor				\$1,650
Subtotal:				\$23,857

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. H. North Hopeton compressor station (continued)**

Line Item 2 (continued)

Labor	No.	Hours	Rate	Total
operator (backhoe, bobcat)	3	50	\$58.07	\$8,710
operator (hydrocrane)	2	50	\$60.53	\$6,053
teamster	3	50	\$49.88	\$7,483
pipefitter/welder	4	50	\$71.43	\$14,286
helper	4	50	\$50.00	\$10,000
laborer	8	50	\$49.53	\$19,814
foreman	1	50	\$72.89	\$3,644
per diem	5 days	crew size: 25	\$100.00	\$12,500
Subtotal:				\$82,489

Material	Total
allow 2% of labor	\$1,650
Subtotal:	\$1,650

Total Direct Costs (2) = \$107,996

3. Remove station equipment (5 days)

Equipment	No.	Hours	Rate	Total
hydrocrane, Grove 30 ton	1	50	\$52.50	\$2,625
hydrocrane, Grove 50 ton	1	50	\$95.96	\$4,798
flatbed truck	1	50	\$20.37	\$1,019
lowboy	1	50	\$47.24	\$2,362
3/4 ton pick-up with trailer	4	50	\$20.44	\$4,087
1/2 ton pickup with 4wd	4	50	\$8.70	\$1,740
small tools, 2% of labor				\$1,386
Subtotal:				\$18,017

Labor	No.	Hours	Rate	Total
operator (crane)	2	50	\$60.53	\$6,053
teamster	2	50	\$49.88	\$4,988
pipefitter/welder	4	50	\$71.43	\$14,286
helper	4	50	\$50.00	\$10,000
laborer	8	50	\$49.53	\$19,814
foreman	1	50	\$72.89	\$3,644
per diem	5 days	crew size: 21	\$100.00	\$10,500
Subtotal:				\$69,285

Material	Total
allow 2% of labor	\$1,386
Subtotal:	\$1,386

Total Direct Costs (3) = \$88,687

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. H. North Hopeton compressor station (continued)**

4. Remove compressor building (5 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B w grapple	2	50	\$68.78	\$6,878
hydrocrane, 30 ton	2	50	\$52.50	\$5,250
flatbed truck	2	50	\$20.37	\$2,037
lowboy	1	50	\$47.24	\$2,362
3/4 ton pick-up with trailer	4	50	\$20.44	\$4,087
1/2 ton pickup with 4wd	4	50	\$8.70	\$1,740
small tools, 2% of labor				\$1,582
Subtotal:				\$23,937

Labor	No.	Hours	Rate	Total
operator	2	50	\$58.07	\$5,807
operator (hydrocrane)	2	50	\$60.53	\$6,053
teamster	3	50	\$49.88	\$7,483
pipefitter/welder	4	50	\$71.43	\$14,286
helper	4	50	\$50.00	\$10,000
laborer	8	50	\$49.53	\$19,814
foreman	1	50	\$72.89	\$3,644
per diem 5 days crew size:	24		\$100.00	\$12,000
Subtotal:				\$79,086

Material	Total
allow 2% of labor	\$1,582
Subtotal:	\$1,582

Total Direct Costs (4) = \$104,604

5. Demolish concrete foundations and compressor blocks to 2-ft below ground surface (5 days)

Equipment	No.	Hours	Rate	Total
backhoe, Cat 325B w hammer	3	50	\$73.99	\$11,099
backhoe, Cat 325B	1	50	\$61.97	\$3,099
dump truck 14 cy	2	50	\$31.79	\$3,179
3/4 ton pick-up with trailer	2	50	\$20.44	\$2,044
1/2 ton pickup with 4wd	2	50	\$8.70	\$870
small tools, 2% of labor				\$996
Subtotal:				\$21,286



**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. H. North Hopeton compressor station (continued)**

Line Item 5 (continued)

Labor	No.	Hours	Rate	Total
operator	4	50	\$58.07	\$11,613
teamster (dump)	2	50	\$49.88	\$4,988
pipefitter/welder	2	50	\$71.43	\$7,143
helper	2	50	\$50.00	\$5,000
laborer	4	50	\$49.53	\$9,907
foreman	1	50	\$72.89	\$3,644
per diem	5 days	crew size:	15	\$100.00
Subtotal:				\$7,500
				\$49,796

Material	Total
Miscellaneous (2% of labor)	\$996
Subtotal:	\$996

Total Direct Costs (5) = \$72,077

6. Restore site (2 days)

Equipment	No.	Hours	Rate	Total
dozer, Cat D-6	1	20	\$71.16	\$1,423
motor grader, Cat 135-H	1	20	\$34.37	\$687
flatbed truck	1	20	\$20.37	\$407
1/2 ton pickup with 4wd	2	20	\$8.70	\$348
small tools, 2% of labor				\$207
Subtotal:				\$3,073

Labor	No.	Hours	Rate	Total
operator	2	20	\$58.07	\$2,323
teamster (flatbed)	1	20	\$49.88	\$998
laborer	4	20	\$49.53	\$3,963
foreman	1	20	\$72.89	\$1,458
per diem	2 days	crew size:	8	\$100.00
Subtotal:				\$1,600
				\$10,341

Material	Total
allow \$ 5000 for backfill, topsoil, seed, fertilizer, straw bales, etc.	\$5,000
Sales tax @ 8%	\$400
Subtotal:	\$5,400

Total Direct Costs (6) = \$18,814

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**I. H. North Hopeton compressor station (continued)**

**Summary: North Hopeton Compressor Station**

<b>A. Pipeline contractor costs</b>	
1. Remove miscellaneous material and access work site	\$7,342
2. Excavate, remove valves, blowdowns and yard piping	\$107,996
3. Remove station equipment	\$88,687
4. Remove compressor building	\$104,604
5. Demolish concrete foundation and compressor blocks to 2-ft below ground surface	\$72,077
6. Restore site	\$18,814
	<hr/>
Pipeline contractor direct costs:	\$399,520
5% Mobilization	\$19,976
	<hr/>
Subtotal:	\$419,496
15% Contractor overhead:	\$62,924
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Subtotal:	\$482,421
10% Contractor profit:	\$48,242
	<hr/>
Total pipeline contractor costs:	\$530,663
 <b>B. Environmental contractor costs (5% of pipeline contractor costs)</b>	
This section reflects work performed by environmental contractor to monitor work and check for presence of hazardous materials. Work involves inspection, sampling, evaluation, and report writing.	
	<hr/>
Total environmental contractor costs:	\$26,533
 <b>C. Storage company inspection costs</b>	
1. Number of days per site	23
2. Company cost per day	\$500
	<hr/>
Total company inspection cost per site:	\$11,500
 <b>D. Storage company management and overhead costs (15% of A + B + C)</b>	
	<hr/>
Total management and overhead cost:	\$85,304
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Total cost to retire North Hopeton compressor station (A + B + C + D):	\$654,001

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**II. Salvage**

**A. Equipment**

	Estimated Salvage (2007\$)
1 Compressor station	(\$88,687)
<b>Total equipment salvage:</b>	<b>(\$88,687)</b>

**B. Scrap Steel**

	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
1 Buildings			
a. Compressor building	150	(\$160)	(\$24,000)
		Subtotal:	(\$24,000)

	Pipe Removed (ft)	Weight Per Foot (lbs)	Total Weight (lbs)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
2 Field lines						
a. 4-inch pipe	17,703	10.79	191,015	96	(\$60)	(\$5,760)
b. 6-inch pipe	1,885	18.97	35,758	18	(\$60)	(\$1,080)
c. 8-inch pipe	15,608	24.70	385,518	193	(\$60)	(\$11,580)
d. 10-inch pipe	0	34.24	0	0	(\$60)	\$0
e. 12-inch pipe	0	43.77	0	0	(\$60)	\$0
f. 14-inch pipe	0	54.57	0	0	(\$60)	\$0
g. 16-inch pipe	0	62.58	0	0	(\$60)	\$0
h. 18-inch pipe	0	82.15	0	0	(\$60)	\$0
i. 20-inch pipe	0	104.13	0	0	(\$60)	\$0
j. 22-inch pipe	0	114.81	0	0	(\$60)	\$0
k. 24-inch pipe	0	140.68	0	0	(\$60)	\$0
					Subtotal:	(\$18,420)

	No. of Wells	Length Per Well (ft)	Weight Per Foot (lbs)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
3 Well tubing						
a. 2-7/8 inch tubing	19	6,510	5.79	358	(\$160)	(\$57,280)

	No. of Wells	Equipment Per Well (ton)	Total Weight (ton)	Scrap Value (ton)	Estimated Salvage (2007\$)
4 Well site equipment					
a. Well head equipment	20	2	40	(\$160)	(\$6,400)
b. Heaters	14	5	70	(\$160)	(\$11,200)
					(\$17,600)

**Total scrap steel salvage:** (\$117,300)

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**Pipeline Contractor Labor Rates and Storage Company Inspection Cost**

A. Pipeline contractor labor rates

		(Note 1)	(Note 2)	(Note 3)		(Note 4)		
		Sept 2006		June 2007		June 2007	Labor	June 2007
		Labor Rate		Labor Rate		Labor Rate	Overhead	Labor Rate
		Including		Including		Adjusted	25% of	Pipeline
		Fringe	Escalation	Fringe	Overtime	for	June 2007	Demolition
		Benefits	Factor	Benefits	Factor	Overtime	Base Rate	Estimate
Trade		(\$/hr)		(\$/hr)		(\$/hr)	(\$/hr)	(\$/hr)
1	Operating engineers:							
2	Crane operator	\$41.50	1.02	\$42.33	1.18	\$49.95	\$10.58	\$60.53
3	Heavy equipment	\$39.81	1.02	\$40.61	1.18	\$47.92	\$10.15	\$58.07
4	Small equipment	\$38.77	1.02	\$39.55	1.18	\$46.66	\$9.89	\$56.55
5	Pipefitter/welder	\$48.97	1.02	\$49.95	1.18	\$58.94	\$12.49	\$71.43
6	Pipefitter/welder helper	\$34.28	1.02	\$34.96	1.18	\$41.26	\$8.74	\$50.00
7	Electrician	\$45.58	1.02	\$46.49	1.18	\$54.86	\$11.62	\$66.48
8	Electrician helper	\$31.91	1.02	\$32.54	1.18	\$38.40	\$8.14	\$46.54
9	Teamster	\$34.20	1.02	\$34.88	1.18	\$41.16	\$8.72	\$49.88
10	Laborer	\$33.96	1.02	\$34.64	1.18	\$40.87	\$8.66	\$49.53
11	Foreman	\$49.97	1.02	\$50.97	1.18	\$60.14	\$12.74	\$72.89
Labor overhead factor:		25%						
Per diem:		\$100						

B. Storage company inspection costs

	Estimated Cost/Day
1 Pipeline and compressor station	\$500
2 Well P&A	\$1,000

Note: Inspection costs include direct labor, per diem, and transportation costs.

Notes

- Hourly union pay scales, September 2006, Kansas City, Missouri (ENR September 25, 2006).
- Escalation factor based on ENR construction cost indices September 2006 of 7763 and June 2007 of 7939 per ENR 6/4/07.
- Work 6-day week, 10-hr day. See workpapers for calculation of overtime factor.
- FICA, unemployment compensation, and workers compensation insurance that employers must pay.

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**Pipeline Contractor Equipment Rates**

	(Note 1)	(Note 2)	
	July 2005		June 2007
	Equipment	Escalation	Equipment
	Rate	Factor	Rate
Equipment Description	(\$/hr)		(\$/hr)
1 air compressor, 160 cfm with hose	\$12.73	1.07	\$13.62
2 paving breaker	\$0.64	1.07	\$0.68
3 concrete pump trailer mounted 25 cy/hr	\$11.74	1.07	\$12.56
4 concrete pump trailer mounted 67 cy/hr	\$47.72	1.07	\$51.06
5 crane, 25 ton, Grove hydrocrane 152 hp	\$43.38	1.07	\$46.42
6 crane, 30 ton, Grove hydrocrane 152 hp	\$49.07	1.07	\$52.50
7 crane, 50 ton, Grove hydrocrane 400 hp	\$89.68	1.07	\$95.96
8 motor grader, Cat 135-H, 135 hp	\$32.12	1.07	\$34.37
9 hydraulic excavator, Bobcat 53, 0.10 cy	\$9.96	1.07	\$10.66
10 hydraulic excavator, Cat 325B, 1.75 cy	\$57.92	1.07	\$61.97
11 hydraulic excavator, Cat 312C, 0.68 cy	\$26.47	1.07	\$28.32
12 hydraulic hammer, NPK, 1300-ft-lb	\$11.23	1.07	\$12.02
13 hydraulic grapple, Labounty 140 TW	\$6.36	1.07	\$6.81
14 lights, 6/1000W, 8 KW gen, trailer mtd.	\$4.89	1.07	\$5.23
15 pipelayer, Cat 561M, 18 ft boom, 40,000 lbs capacity	\$29.78	1.07	\$31.86
16 pipelayer, Cat 572R, 20 ft boom, 90,000 lbs capacity	\$56.82	1.07	\$60.80
17 tractor, Cat D-6R, 165 hp	\$66.50	1.07	\$71.16
18 winch for D-6R dozer	\$6.37	1.07	\$6.82
19 track loader, Cat 953C, 2.25 cy	\$42.54	1.07	\$45.52
20 dump truck 8 cy	\$18.81	1.07	\$20.13
21 dump truck 14 cy	\$29.71	1.07	\$31.79
22 flatbed truck	\$19.04	1.07	\$20.37
23 pipe truck	\$39.42	1.07	\$42.18
24 lowboy 50 ton	\$44.15	1.07	\$47.24
25 1/2 ton pickup, 4wd	\$8.13	1.07	\$8.70
26 3/4 ton pickup, 4wd	\$9.97	1.07	\$10.67
27 welder, trailer mounted, 45 hp	\$9.13	1.07	\$9.77

Notes

- Hourly Equipment Rates from July 2005, US Army Corps of Engineers Construction Equipment Ownership and Operating Expense Schedule, Region VI.
- Escalation factor based on ENR construction cost indices July 2005 of 7422 and June 2007 of 7939 per ENR 3/19/07 and 6/4/07.

**Southwest Gas Storage Company  
Final Abandonment Estimate - North Hopeton Storage Field**

**Workpapers**

A. Overtime factor for six 10-hour days worked per week

	Hours Worked	Overtime Factor	Pay units
Straight-time 8 hours/day M-F	40	1	40
Overtime 2 hours/day M-F	10	1.5	15
Overtime Saturday first 8 hours	8	1.5	12
Overtime Saturday last 2 hours	2	2	4
Total:	60		71

Overtime factor: 1.18

B. Estimated number of environmental tests

	No. of Sites	Tests per Site	Total
1 Well sites	20	1	20
2 Compressor equipment	3	9	27
3 Miscellaneous @ 1 per 5000 sf	12	1	12
			47

C. Compressor equipment

	Engine	Rated HP
1	U-365	650
2	U-201	2500
3	U-202	2500
		5650

D. Field line mileage

Field Line Length (ft)	Field Line Length (mile)
35,196	6.67