



Tyrone Operations  
P.O. Drawer 571  
Tyrone, NM 88065

June 23, 2008



**Certified Mail # 70070710000177754845**  
**Return Receipt Requested**

Mr. Clint Marshall  
New Mexico Environment Department  
Mining Environmental Compliance Section  
Ground Water Quality Bureau  
1190 St. Francis Dr.  
Santa Fe, NM 87501

**Certified Mail # 70070710000177754838**  
**Return Receipt Requested**

Mr. David R. Ohori  
New Mexico Energy, Mines and Natural Resources Department  
Mining and Minerals Division  
Mining Act Reclamation Program  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Dear Messrs. Marshall and Ohori:

**RE: Response to Primary Issues Letter on Tyrone's Updated  
Closure/Closeout Plan dated April 23, 2008, DP-1341 and GR010RE**

This letter provides responses to your letter of April 23, 2008, relating to the primary issues the agencies have identified for the Freeport-McMoRan Tyrone Inc. ('Tyrone') Closure/Closeout Plan update (CCP). The updated plan was submitted to both agencies on October 11, 2007. As indicated in the following responses, there are a number of issues that have not yet been resolved and which require further discussions before Tyrone can prepare an update of the CCP and the closure and closeout cost estimates in a form agreeable to Tyrone, NMED and MMD. Tyrone requests a meeting with both agencies to further discuss these issues so that we can make progress towards permit renewal.

Tyrone was surprised by the agencies' description of the CCP as "technically inadequate for preventing pollution, stabilizing waste piles and establishing an effective cover system on waste piles at the Tyrone Mine." Tyrone has nearly completed reclamation of all tailing facilities and has initiated extensive reclamation efforts on stockpiles, well beyond the accelerated reclamation of the 1C stockpile removal from Oak Grove and we understood that the agencies were pleased with these efforts. In addition to this work, over the past five years

we have strived to implement the conditions in DP-1341 and GR010RE in a cooperative manner in an effort to prevent the agencies later reaching just this conclusion. Several of these conditions directed us to perform comprehensive studies and onsite testing with the objective of providing a sound scientific and engineering basis for the reclamation designs that we propose. These reclamation efforts, programs and studies, have all been submitted for review by both agencies and Tyrone has addressed the comments raised by both agencies to date. Given the level of effort and expense incurred by Tyrone on this work, it is discouraging to us that the agencies now believe the CCP to be technically inadequate.

The agencies' April 23 letter addresses several design elements of the updated CCP on an independent basis. On the other hand, Tyrone's feasibility study, on which the updated CCP was based, evaluates the expected performance of the combination of design elements proposed in the CCP as a whole. Tyrone firmly believes that expected CCP performance is most appropriately addressed by evaluating the overall performance of the proposed plan, not individual design elements. This difference in approach is reflected in Tyrone's responses below. In addition, the agencies' positions on the individual design elements omit design details that are critical to the performance of a design. For example, reasoned conclusions regarding the performance of slope steepness with respect to erosion and other factors cannot be made without considering maximum slope lengths and drainage design, as well as other factors such as the characteristics of the cover material. The agencies' position on slopes as expressed in the April 23 letter does not consider all of the key technical factors. Tyrone proposes that further discussions regarding the updated CCP be approached considering the overall plan and its expected performance rather than a piecemeal approach in which the major design elements are separately considered and addressed. This approach would further allow for a more refined approach to design in which different designs may be used for different stockpile areas.

A holistic approach to the updated CCP is particularly important with respect to any revisions to the cost estimate. Changes to the extent of covers, for example, will affect water treatment costs to some degree. Consequently, before preparing a revised cost estimate, Tyrone seeks agreement on the overall plan.

Our responses to the primary issues identified in your letter follow.

- 1) **Leach Ore and Waste Rock Stockpile Reclamation.** NMED and MMD require Tyrone to provide for and estimate the costs of extending the cover placement to leach ore stockpiles and waste rock piles within the area described by Tyrone as the surface water capture zone (SWCZ). Top surfaces and slopes of the waste rock piles and leach stockpiles within the SWCZ must be covered and the clean storm water managed to reduce the amount of contaminated storm water and leachate generated. Tyrone's proposal does not adequately provide for reducing infiltration and leachate generation within the SWCZ. According to the Tyrone Feasibility Study dated November 12, 2007, the rate of sulfate loading will increase in the areas without cover within the SWCZ. Even small amounts of contaminated water have the

**potential to contaminate large areas of fractured bedrock aquifers that are very difficult to abate.**

**In addition, MMD requires Tyrone to apply for a waiver for open pits or waste units from the requirements of achieving a post-mining land use or self-sustaining ecosystem. The waiver application must show that achieving a post-mining land use or self-sustaining ecosystem is not technically or economically feasible or is environmentally unsound.**

Tyrone is concerned that NMED's and MMD's directions do not consider the expected performance of the alternatives presented in the Feasibility Study submitted by Tyrone under the conditions of DP-1341 or all of the factors required to be considered under DP-1341 to evaluate the alternatives agreed upon by Tyrone, NMED and MMD. The Feasibility Study evaluated a range of closure designs and various combinations of the alternative design elements. DP-1341 further presented cost estimates for all of those alternatives, including alternatives that called for regrading and covering the slopes and top surfaces of leach ore stockpiles and waste rock stockpiles within the SWCZ. The Feasibility Study compared the relative performance of the alternatives, including comparison of the costs of different regrading and cover configurations for stockpiles with the potential cost savings for water treatment based upon the projected reduction of pollutant loading. The Feasibility Study concluded that the cost of the additional regrading and covering within the SWCZ is not justified based upon reduced water treatment costs. Tyrone has not yet received comments from NMED or MMD on the Feasibility Study report.

Technical experts believe and the Tyrone Feasibility Study incorporates the concept that stockpile seepage quality is unlikely to improve significantly with time regardless of the extent of regrading and covers. As a result, because regrading and covering the stockpiles will not entirely eliminate seepage, there is no expectation that reclamation of the interior slopes will decrease the size of the area where ground water currently exceeds the standards of 20.6.2.3103 NMAC for the foreseeable future. Thus, even though the rate of mass loading is predicted to be lower under the complete cover alternative, sulfate mass loading will not be eliminated and stockpile seepage will need to be collected and treated prior to release in order to meet WQA standards. Tyrone has committed to the collection and treatment of the water and to the control of public access to the mine area. We believe that the measures proposed will protect human health and safety and achieve protection of the surrounding environment.

The April 23 letter suggests that "even small amounts of contaminated water have the potential to contaminate large areas of fractured bedrock aquifers that are very difficult to abate." As discussed above, if this is a concern, it will not be addressed by additional cover, since seepage is expected to occur under all of the alternatives. Moreover, Tyrone is not aware of any information or data that indicate there would be any difference in the horizontal or vertical extent of impacts to aquifers with or without regrading and covering stockpile slopes within the SWCZ. Tyrone's hydrologic studies within the area of the Main Pit refute such a contention by demonstrating the gradient of ground water flow is toward the pit

bottoms and that ground water within the area of the SWCZ reports to the pit bottoms where it will be captured and treated following closure. These hydrologic conditions will persist with continued pumping of impacted water from the pits as proposed in the CCP.

As NMED is well aware, Tyrone's position is that the SWCZ is not a "place of withdrawal of water for present or reasonably foreseeable future use" following closure such that WQCC ground water quality standards apply within the SWCZ. This issue, which is being considered by the Water Quality Control Commission, impacts the closure and reclamation requirements for both areas within the SWCZ and other areas.

MMD issued a waiver of reclamation requirements for certain portions of the area within the SWCZ based upon a comparison of the estimated costs of reclamation to the anticipated benefits, which concluded that reclamation of certain stockpile slopes within this area is not warranted. Tyrone is not aware of any new information that would change MMD's previous conclusion regarding the areas covered by the waiver. Tyrone acknowledges the need to apply to MMD for a waiver from the "self-sustaining ecosystem" standard for areas within the SWCZ not currently covered by a waiver. However, Tyrone requests the opportunity to attempt to reach agreement regarding the scope of covering and regrading in the SWCZ based upon the Feasibility Study before Tyrone develops an application to MMD for a broader waiver.

- 2) **Cover Thickness. NMED and MMD require Tyrone to provide for and estimate the costs of placement of a minimum cover thickness of 36 inches for a store and release cover instead of the proposed 24 inches for leach stockpiles and waste rock piles. Tyrone must also estimate the costs for placement of a cover thickness of 36 inches for a store and release cover for the tailing impoundments. Even without the test plot data for calibration of the model, the computer simulations suggest a reduced number and magnitude in the infiltration events by increasing the cover thickness from 24 to 36 inches.**

Field evidence indicates that a 24-inch cover is sufficient to support a self-sustaining ecosystem. The soil water model predicts that drainage will occur regardless of the cover thickness and alternative water control or abatement techniques may be required to address water quality issues. Thus, Tyrone maintains that 24 inches of cover in combination with the water management and treatment systems complies with applicable portions of the WQCC and WQA and Mining Act.

Tyrone believes that discussions related to the cover thickness must be comprehensive and consider issues associated with the chemical and physical character (e.g., pH and rock fragments) of the cover, construction thickness tolerances, channel construction and final grading requirements. Furthermore, the Agencies need to identify immediate and long-term performance objectives for the cover. Tyrone cannot commit to a particular cover thickness without incorporating the more detailed specifications for the cover based upon the above criteria that are critical to predicting cover performance.

Tyrone has committed to and is proceeding with several studies with the understanding that this information will ultimately help to resolve the technical issues surrounding cover thickness. Specifically, it is anticipated that the ongoing test plot studies will provide the additional data required to calibrate the soil cover models and that the results of the Comprehensive Cover Performance Evaluation (CCPE) study will ultimately provide the technical basis for establishing the minimum cover thickness. Tyrone intends to proceed with these studies on the basis that if the results of the CCPE and other studies support an alternative cover thickness, the NMED and MMD will agree to use these results as the technical basis for determination of the appropriate cover thickness for future reclamation activities. With this in mind, as part of further discussions, Tyrone is willing to consider amending the CCP to provide for 36-inch covers on some areas based upon the existing technical information. Tyrone would then develop a revised cost estimate incorporating 36 inch covers for the agreed-upon areas.

- 3) **Slope Angle.** NMED and MMD require Tyrone to provide for and estimate the costs of regrading of slopes to 3 to 1 or flatter for waste rock piles and leach ore stockpiles. The proposed design of 2.5 to 1 will likely result in increased operation and maintenance costs for the cover system and storm water management. The flatter slopes will increase stability and reduce erosion that may affect the store and release cover performance. The test plots are evaluating the performance of different slope angles. NMED remains flexible for design issues that arise in constrained areas and Tyrone may propose certain slopes steeper than 3 to 1 for agency review and approval.

Tyrone maintains that the 2.5:1 design is a functional and effective proposal. In its updated CCP, Tyrone has reduced the slope length from 300 feet for the 3:1 slopes to 175 feet for the 2.5:1 slopes to compensate for potentially higher erosion rates associated with the 2.5:1 slopes. Because of the compensating effects of slope length, the predicted erosion rates for the 2.5:1 and 3:1 slopes are similar. The test plots constructed on Stockpile No.1 at a 2.5:1 slope are performing as well as the 3:1 slopes with no excessive erosion and with successful establishment of vegetation. Tyrone is unaware of any information or data to support NMED and MMD's contention that the 2.5:1 slope design will result in increased maintenance and storm water management costs. Nevertheless, Tyrone already has constructed slopes for reclaimed areas of the stockpiles with 3:1 slope segments, and Tyrone is willing to discuss whether some additional areas are appropriate for 3:1 interbench slopes.

- 4) **Net Present Value Proposal.** NMED and MMD require Tyrone to submit a net present value proposal for agency review. The proposal must include a basis for the recommended discount and escalation (inflation) rates. Also, the proposal must include a time period for use of specific rates.

Tyrone has conducted a review of the escalation rates and discount rates following the same process that was developed and applied to the initial financial assurance calculations

Messrs. Marshall and Ohori

June 23, 2008

Page 6

used in the existing permits. Below you will find a discussion on the updated analysis of the recommended rates and Attachment A has the backup details used in the analysis.

The escalation rate calculation was updated using the same methodology as previously used. We used publicly available indices that were appropriate for and specifically related to the costs associated with the reclamation plan. A composite index was developed for both earth work and water treatment using the same cost categories, data sets (updated through 2007) and calculation method as previously used. Based upon this updated information, we calculated an annual escalation rate for earth work of 3.73% and an annual escalation rate for water treatment of 3.38% (compared with 3.68% and 3.17%, respectively, in the prior calculation).

The discount rate was calculated using MMD NPV Guidance issued December 29, 2004. We calculated an average annualized return for the Lehman Brothers U.S. Government/Credit Index rate of returns for years 1 through 10 and an average annualized return for the Lehman Brothers U.S. Aggregate Index for years beyond and including year 11. The rates of returns for both indices were obtained from the LehmanLive Website. The resulting proposed discount rates are 8.20% for years 1 through 10 and 8.55% for years beyond and including year 11. The rates used in the previous NPV calculations were 5% for years 1 through 12 and 8% for years beyond 12.

We look forward to your response on these important issues and suggest that we meet soon to discuss them. Please call me or Brent Fletcher if you have any questions or comments.

Sincerely,



Richard N. Mohr  
General Manager

RNM:cj  
Attachment  
20080623-100

c: Dalva Moellenberg, G&K  
Sheila Deely, FCX

Attachment A

**Backup Details for Proposed Escalation Rates and  
Discount Rates**

**DIRT WORK RECLAMATION ESCALATION RATE -- GEOMETRIC MEAN METHOD**

Current Calculation		Previous Calculation	
Category	Rate	Category	Rate
Labor	3.36%	Labor	3.75%
#2 Diesel Fuel	7.82%	#2 Diesel	4.77%
Machinery & Equipment	2.83%	Machinery & Equipment	3.31%

Current Calculation Rate: 10%      % of Project: 50%      % of Escalation Rate: 1.88%

Previous Calculation Rate: 17%      % of Project: 10%      % of Escalation Rate: 0.48%

Current Calculation Rate: 73%      % of Project: 40%      % of Escalation Rate: 1.33%

Previous Calculation Rate: 2.07%      % of Project: 40%      % of Escalation Rate: 1.33%

DIRT WORK RECLAMATION ESCALATION RATE: 3.73%

DIRT WORK RECLAMATION ESCALATION RATE: 3.68%

**Labor Composite**  
 Current Source  
 Years 1972 - 2002  
 31 years

Bureau of Labor Statistics (NM)  
 Series ID : SAU3500002000014 (n)  
 Not Seasonally Adjusted  
 State : New Mexico  
 Area : Statewide  
 Industry : Construction  
 Detail : A 1-digit Industry (Industry Division)  
 Data Type : Average Weekly Earnings (in dollars)  
 Benchmark Year : 2001  
 Years: 1972 - 2002  
 (n): NAICS 2002 replaces SIC beginning March 2003. See <http://www.bls.gov/sae/saenals.htm> for details.

**Labor Composite**  
 Previous Source

Bureau of Labor Statistics (NM)  
 Series ID : SAU3500002000014  
 Not Seasonally Adjusted  
 State : New Mexico  
 Area : Statewide  
 Industry : Construction  
 Detail : A 1-digit Industry (Industry Division)  
 Data Type : Average Weekly Earnings (in dollars)  
 Benchmark Year : 2000  
 Years: 1972 - 2001

**Current Source**  
 Years 2003 - 2008  
 6 years

Bureau of Labor Statistics (NM)  
 Series ID : SMU3500000200000004  
 Not Seasonally Adjusted  
 State : New Mexico  
 Area : Statewide  
 Supersector : Construction  
 Industry : Construction  
 Data Type : Average Weekly Earnings, In Dollars  
 Years: 2003 - 2008

(n) series data stopped at 2002. New series ID uses similar criterias as the old series ID.  
 See <http://www.bls.gov/sae/saenals.htm> for details.

**#2 Diesel Composite**  
 Current Source  
 No change  
 24 years

Producer Price Index-Commodities  
 Series ID : WPS057303  
 Seasonally Adjusted  
 Group : Fuels and related products and power  
 Item : #2 diesel fuel  
 Base Date : 8200  
 Years: 1985 - 2008

**#2 Diesel Composite**  
 Previous Source

Producer Price Index-Commodities  
 Series ID : WPS057303  
 Seasonally Adjusted  
 Group : Fuels and related products and power  
 Item : #2 diesel fuel  
 Base Date : 8200  
 Years: 1985 - 2001

**Machinery & Equipment Composite**  
 Current Source  
 14 years WPS1129  
 9 years WPU112D

Producer Price Index-Commodities  
 Series ID : WPU112D\*  
 Not Seasonally Adjusted  
 Group : Machinery and equipment  
 Item : Off-highway equipment ex. Parts  
 Base Date : 9912  
 Years: 2000 - 2008

**Machinery & Equipment Composite**  
 Previous Source

Producer Price Index-Commodities  
 Series ID : WPS1129  
 Seasonally Adjusted  
 Group : Machinery and equipment  
 Item : Off-highway equipment  
 Base Date : 8200  
 Years: 1982 - 1999

\* WPS1129 was discontinued on 1999. WPU112D is the closest report to the old WPS1129 report.



http://data.bls.gov/cgi-bin/srgate

### State and Area Employment, Hours, and Earnings

Years: 1972 - 2002  
 Series ID : SAU3500002000014 (n)  
 Not Seasonally Adjusted  
 State : New Mexico  
 Area : Statewide  
 Industry : Construction  
 Detail : A 1-digit Industry (Industry Division)  
 Data Type : Average Weekly Earnings (in dollars)  
 Data Type : Average Weekly Earnings, in Dollars

Years: 2003 - 2008  
 Series ID : SAU350000200000004  
 Not Seasonally Adjusted  
 State : New Mexico  
 Area : Statewide  
 Supersector : Construction  
 Industry : Construction  
 Data Type : Average Weekly Earnings, in Dollars

**Data:**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann	% Change	Convert to Positive
1972	242.5	211.33	216.4	191.07	196.78	199.43	195.22	196.33	180.01	242.76	195.58	206.97	207.23	N/A	N/A
1973	192.39	271.7	201.56	193.29	196.72	205.52	214.7	214.3	211.7	220.17	224.45	232.97	213.94	3.24%	1.03
1974	244.5	266.49	267.86	235.13	215.41	237.23	225.15	229.9	241.2	232.1	243.17	255.06	239.9	12.13%	1.12
1975	240.75	237.62	268.62	310.9	258.05	253.23	257.85	263.48	250.5	275.22	258.91	276.86	263.58	9.45%	1.08
1976	264.04	251.98	344.67	341.7	364.63	308.84	263.53	271.81	264.63	260.37	260.23	259.17	287.66	9.55%	1.10
1977	254.54	267.71	263.52	281.89	285.76	271.2	270.11	278.61	286.51	316.79	316.84	307.09	284.24	-1.19%	0.99
1978	289.67	329.82	335.94	294.89	297.6	290.3	300.58	305.49	304.56	311.92	302.68	305.27	305.11	7.34%	1.07
1979	309.88	288.27	315.58	296.48	294.37	297.54	304.67	304.29	307.08	319.23	304.38	330.28	305.89	0.26%	1.00
1980	328.06	322.94	344.2	369.37	346.3	343.2	350.42	336.88	353.42	339.38	328.94	351	342.61	12.00%	1.12
1981	342.02	355.22	341.79	369.63	384.93	378.89	382.88	371.94	357.92	387.72	366.8	399.85	369.94	7.98%	1.08
1982	362.96	368.22	423.05	359.84	426.58	377.05	392.15	406.5	386.64	404.42	358.45	370.29	386.9	4.58%	1.05
1983	388.08	381.99	395.16	358.5	363.6	372.42	367.56	387.02	403.25	383.36	347.22	383.59	376.62	-2.66%	0.97
1984	382.69	389.12	402.5	387.55	379.78	377.03	391.93	387.45	382.6	379.54	371.11	376.92	383.52	1.83%	1.02
1985	377.2	381.98	359.5	380.54	387.19	370.99	374.76	391.62	409.22	373.46	373.82	385.09	380.55	-0.77%	0.99
1986	395.3	382.95	394.13	409.84	399.86	398.05	393.58	406.98	392.35	392.09	444.8	386.63	398.57	4.74%	1.05
1987	392.41	405.91	401.06	397.5	400.16	402.98	402.98	432.22	402.5	426.89	409.26	403.2	405.98	1.86%	1.02
1988	399.67	415.13	416.48	409.88	423.75	427.98	424.46	447.82	436.5	448.77	428.22	445.7	425.12	5.45%	1.05
1989	431.88	412.54	436.8	439.31	435.84	430.1	444.14	452.13	471.22	460.85	426.73	438.66	440.35	2.86%	1.03
1990	441.56	459.93	460.09	445.17	455.31	468.83	444.89	442.38	453.47	430.4	420.33	441.78	446.56	1.41%	1.01
1991	422.07	416.1	428.37	432.61	442.6	433.22	431.2	424.32	435.37	444.16	412.4	419.63	428.61	-4.02%	0.96
1992	419.18	435.86	448.81	438.47	445.74	446.1	453.2	452.8	430.85	466.38	451.92	445.44	444.6	3.73%	1.04
1993	435.75	448.91	453.56	448.92	466.76	469.34	472.93	490.77	493.29	512.25	488.17	500.99	475.91	7.04%	1.07
1994	495.46	483.03	466.83	483.8	474.71	482.51	506.52	504.71	502.25	503.47	469.56	520.4	490.84	3.14%	1.03
1995	524.06	509.44	505.94	466.93	474.79	495.69	492.48	484.4	486.33	503.48	484.67	516.53	494.86	0.82%	1.01
1996	513.38	514	497.44	491.88	515.3	515.62	536.18	525.37	514.8	530.88	498.75	503.54	513.48	3.76%	1.04
1997	452.87	509.84	509.56	512.4	530.75	536.01	523.26	542.82	538.67	530.33	498.58	511.43	517.86	0.85%	1.01
1998	512.53	514.83	524.26	541.63	523.64	527.61	531.98	503.39	514.95	504.44	512.62	518.22	518.22	0.07%	1.00
1999	509.97	507.1	519.17	534.5	550.74	556.37	548.66	560.2	544.6	575.3	549.66	557.67	543.91	4.86%	1.05
2000	559.5	556.27	554.68	576.11	574.56	580.55	583.83	569.15	598.04	573.5	592.8	625.6	580.94	6.81%	1.07
2001	617.39	608.36	609.23	565.36	595.89	591.32	588.34	569.97	577.5	592.5	570.51	557.96	583.89	0.51%	1.01
2002	547.88	546.97	533.63	560.47	556.88	563.01	555.99	579.77	560.88	599.54	600.5	628.49(D)	569.50	-2.46%	0.98
Change to new Series per note below															
2002	598.19	586.61	602.65	597.64	591.97	593.6	598.99	596.29	598.99	603.2	601.69	604.4	598.68	4.41%	1.04
2003	604.4	601.38	601.38	600.26	602.57	603.37	603.37	603.37	603.37	603.37	603.37	603.37	603.37	0.98%	1.01
2004	609.4	611.78	612.22	614.99	616.57	618.55	622.5	624.08	627.25	628.44	629.64	629.64	620.91	2.70%	1.03
2005	631.23	634.01	634.01	637.99	641.59	640.78	642.37	645.18	649.62	653.67	658.94	661.78	644.4	3.78%	1.04
2006	660.56	660.14	659.31	662.16	662.96	661.73	660.45	660.4	660.74	665.66	666	671.34	662.5	2.81%	1.03
2007	670.47	669.2	656.1	672.80(p)											
2008															

**Arithmetic mean:** 3.43%  
**Geometric mean:** N/A

P : Preliminary  
 Old Series ID : SAU3500002000014 / SAU3500002000014 (n)  
 (n) : Standard Industrial Classification (SIC) is replaced by North American Industrial Classification System (NAICS) in 2002. The (n) series data stopped at 2002. New series ID uses similar criteria as the old series ID. See <http://www.bls.gov/sae/senaks.htm> for details.

<http://data.bls.gov/cgi-bin/srgate>

**PPI Commodity Data**

**Series Catalog:**

Series ID : wps057303

Seasonally Adjusted

Group : Fuels and related products and power

Item : #2 diesel fuel

Base Date: 8200

Data:\*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann	% Change	Convert to Positive
1985						80.5	78.7	78.1	79.4	80.1	82.1	84.7			N/A
1986	79.7	63.7	49.9	48.9	45.1	44	37.4	40	46	41.5	41.5	43.8	48.46		N/A
1987	48.1	52.9	49.9	50.7	52.8	56.1	59.9	63.6	59.3	58.7	59.1	55	55.51	14.55%	1.15
1988	52.1	52.1	51.4	53.6	55.1	53	50.8	49.8	47.6	40.4	44.1	47.5	49.79	-10.30%	0.90
1989	52.4	55.8	58.9	63	58.2	55.6	56.1	56.2	59.9	61.8	61.5	66.5	58.83	18.14%	1.18
1990	85.1	61.2	62.5	62.6	60	56.7	55.2	75.1	86.8	95.9	91.1	88.8	73.42	24.81%	1.25
1991	82.5	77.2	63.3	61.3	61.6	61.3	62.6	64.4	64.3	61.4	65.2	62	65.59	-10.66%	0.89
1992	55.5	59	57	59.2	62.8	68.5	68	65	63.9	64.1	60.5	59.6	61.93	-5.59%	0.94
1993	61.9	62.8	65.5	64.5	64.3	63.3	59.9	54.6	58.6	62.1	59.1	50.6	60.60	-2.14%	0.98
1994	52.6	58.8	58.6	55.1	54	54.9	58.2	58.5	56.1	55.3	56.1	54.3	56.04	-7.52%	0.92
1995	55.3	54.7	57.4	58.9	59.2	58.1	55.3	56.3	56.6	55.3	56.5	59.9	56.96	1.64%	1.02
1996	63.8	61	64.8	75.9	74.6	67.2	68.4	67.3	71.4	75.8	72.4	76.1	69.89	22.71%	1.23
1997	74.4	74.8	70	66.3	62.7	63.6	60.4	63.1	58.4	60.5	61.5	58.9	64.55	-7.64%	0.92
1998	54.8	53.4	50.2	51	49.9	47.7	46.3	44.7	44.6	44.1	43.1	39.4	47.43	-26.52%	0.73
1999	41.2	38.6	46.3	54.5	53.2	55.6	61.8	66.9	63.4	63.1	66.8	73.8	57.10	20.38%	1.20
2000	80.3	89.7	92.5	84	82.3	87.5	90.8	90.5	104.6	102.1	105.4	107.3	93.08	63.02%	1.63
2001	103.4	97.7	85.1	88.7	92.5	91.5	81.9	80.3	83.6	69.8	70	58.9	83.62	-10.17%	0.90
2002	61	63.6	71.2	75.1	75.4	74.8	78.3	78.4	85.9	90.4	85.1	92.7	77.66	-7.13%	0.93
2003	106.4	133.6	129.1	99.9	86.8	89.5	93.5	96.3	84.2	95.3	93.3	103.8	100.98	30.02%	1.30
2004	119.3	111.9	109.6	116.8	119.4	113.9	123.5	134.5	130.4	157.1	155.6	143.3	127.94	26.71%	1.27
2005	153.5	161.6	173.6	170.3	168.4	186.7	190	198.6	197.6	248.9	201.9	210.9	188.50	47.33%	1.47
2006	214.5	211.9	207.1	223.3	236.5	246.2	236.7	246.7	187.4	186.3	193.9	215.7	217.18	15.22%	1.15
2007	197.5	208.8	220.9	230.4	223.6	226.7	242.3	227.3	229.7	235.9	291.7(P)	289.3(P)	235.34	8.36%	1.08
2008	306.3(P)	309.2(P)	356.5(P)	353.4(P)											

Arithmetic mean:

Geometric mean:

P : Preliminary. All indexes are subject to revision four months after original publication.

\* : Data is regularly evaluated per revised seasonal factor every year

9.77%  
N/A  
9.77%  
7.82%

<http://data.bls.gov/cgi-bin/srgate>

**PPI Commodity Data**

Series Id: WPU112D\*

Not Seasonally Adjusted

Group: Machinery and equipment

Item: Off-highway, equipment, ex. parts

Base Date: 9912

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	% Change	Convert to Positive
1982	97.8	98.2	98.8	99.4	100.1	100.5	100.3	100.6	100.9	100.8	101.2	101.4	100	N/A	N/A
1983	101.2	101.2	101.6	101.4	101.8	102	102.6	102.8	103	102.9	103.1	103.1	102.2	2.22%	1.02
1984	102.9	103	103.1	103.2	103.1	103.4	103.5	103.6	103.7	103.7	103.8	103.9	103.4	1.16%	1.01
1985	104.3	104.4	104.4	104.5	104.4	104.3	104.2	104.3	104.3	104.5	104.2	104.4	104.4	0.91%	1.01
1986	104.3	104.4	104.6	104.8	104.8	104.4	104.3	104.3	104.4	104.6	106.5	106.7	104.8	0.47%	1.00
1987	105.6	105.8	105.9	106	107.5	107.1	106.8	106.8	107.5	107.6	107.9	108.1	106.9	1.95%	1.02
1988	108.8	110.2	109.9	110.4	110.7	110.2	112.8	112.9	113.4	113.8	114.1	114.6	111.8	4.62%	1.05
1989	116.7	116.4	117.9	118.5	119.3	122.7	121.1	121.6	121.9	122.3	122.5	122.8	120.3	7.59%	1.08
1994	134.9	134.8	134.9	135.3	135.5	135.7	136	136.3	136.4	136.8	137.1	137.2	135.9	12.97%	1.13
1995	137.7	138.5	138.4	138.4	138.6	138.8	139	139.3	139.5	139.8	140.1	140.9	139.1	2.34%	1.02
1996	140.4	141.8	141.7	141.7	141.8	143.1	143.2	143.5	143.8	144.1	144.4	144.7	142.9	2.71%	1.03
1997	144.7	144.8	144.9	146.1	146.2	146.1	146.3	146.6	146.9	147.2	147.5	147.8	146.3	2.39%	1.02
1998	148.7	148.7	149.4	149.1	149.4	149.7	149.9	150.3	150.6	150.9	151.1	151.7	150.0	2.53%	1.03
1999	150.1	151.3	151.2	152.3	152.6	152.9	153.1	153.4	153.7	154	154.3	154.6	152.8	1.89%	1.02
1999	Change to new Series per note below														
2000	101.2	101.3	101.3	101.4	101.4	101.4	101.4	101.4	101.4	101.4	101.4	101.4	101.4	1.40%	1.01
2001	101.6	101.6	101.6	101.7	101.7	101.7	101.7	101.7	101.7	102.2	102.3	102.4	101.8	0.39%	1.00
2002	102.9	102.9	102.9	102.9	102.9	102.9	102.9	103.1	103.1	103.1	103.3	103.3	103.0	1.18%	1.01
2003	104.2	104.2	104	104	104.1	104.1	104.1	104.1	104.1	104.1	104.5	104.6	104.2	1.17%	1.01
2004	105.4	105.7	105.8	106.7	106.8	107	108.7	108.8	108.8	108.1	108.1	107.9	107.3	2.98%	1.03
2005	109.9	109.7	109.7	109.7	111.6	113.1	113.1	113.1	113.1	113.5	113.7	114	112.0	4.38%	1.04
2006	115.9	116.1	116.2	116.2	115.9	116	116	116	116.4	116.7	116.7	116.6	116.2	3.75%	1.04
2007	117.7	117.7	117.4	117.5	117.5	117.5	117.5	117.6	117	117.9	118.3(p)	118.3(p)	117.7(p)	1.29%	1.01
2008	118.8(P)	120.3(P)	120.5(P)	120.5(P)											

Arithmetic mean:

Geometric mean:

P : Preliminary. All indexes are subject to revision four months after original publication.

\* : WPS1129 was discontinued on 1999. WPU112D is the closest report to the old WPS1129 report.

2.87%

N/A

2.83%

**WATER TREATMENT RECLAMATION ESCALATION RATE – GEOMETRIC MEAN METHOD**

Current Calculation Category	Rate	Annual Cost	% of Project	% of Escalation Rate
Reagents	2.98%	\$2,785,000.00	71.39%	2.13%
Power	3.80%	\$126,000.00	3.23%	0.12%
Labor	3.59%	\$395,000.00	10.13%	0.36%
Maintenance	5.03%	\$595,000.00	15.25%	0.77%
		\$3,901,000.00	100.00%	

**Water Treatment Reclamation Escalation Rate: 3.38%**

**Lime Composite**

Current Source  
No Change  
103 years  
US Geological Survey  
Unit value per metric ton of lime  
Years: 1904 - 2006

**Power Composite**

Current Source  
No Change  
48 years  
US Energy Information Administration  
Retail Prices of Electricity Sold by Electric Utilities (Table 7.4 and Table 9.9)  
Years: 1960 - 2007

**Labor Composite - See Labor Summary**

**Maintenance Composite - See Maintenance Summary**

Previous Calculation Category	Rate	Annual Cost	% of Project	% of Escalation Rate
Lime	2.88%	\$806,200.00	49.37%	1.42%
Power	3.56%	\$421,700.00	25.82%	0.92%
Labor	3.58%	\$194,400.00	11.90%	0.43%
Maintenance	3.15%	\$210,700.00	12.90%	0.41%
		\$1,633,000.00	100.00%	

**Water Treatment Reclamation Escalation Rate: 3.17%**

**Lime Composite**

Previous Source  
US Geological Survey  
Unit value per metric ton of lime  
Years: 1904 - 1999

**Power Composite**

Previous Source  
US Energy Information Administration  
Retail Prices of Electricity Sold by Electric Utilities  
Years: 1960 - 2000

**Labor Composite - See Labor Summary**

**Maintenance Composite - See Maintenance Summary**

**LIME STATISTICS<sup>1</sup>**  
**U.S. GEOLOGICAL SURVEY**

[All values in metric tons (t) lime unless otherwise noted]  
 Last modification: November 2, 2007

Year	Unit value (\$/t)	% Change	Convert to Positive
1904	0.00	N/A	N/A
1905	0.00	N/A	N/A
1906	4.30	N/A	N/A
1907	4.51	4.88%	1.05
1908	4.42	-2.00%	0.98
1909	4.38	-0.90%	0.99
1910	4.43	1.14%	1.01
1911	4.45	0.45%	1.00
1912	4.36	-2.02%	0.98
1913	4.54	4.13%	1.04
1914	4.33	-4.63%	0.95
1915	4.39	1.39%	1.01
1916	5.01	14.12%	1.14
1917	6.93	38.32%	1.38
1918	9.22	33.04%	1.33
1919	9.75	5.75%	1.06
1920	11.60	18.97%	1.19
1921	10.80	-6.90%	0.93
1922	10.10	-6.48%	0.94
1923	10.80	6.93%	1.07
1924	10.70	-0.93%	0.99
1925	10.30	-3.74%	0.96
1926	10.00	-2.91%	0.97
1927	9.65	-3.50%	0.97
1928	9.01	-6.63%	0.93
1929	8.64	-4.11%	0.96
1930	8.33	-3.59%	0.96
1931	7.60	-8.76%	0.91

**LIME STATISTICS<sup>1</sup>**  
**U.S. GEOLOGICAL SURVEY**

[All values in metric tons (t) lime unless otherwise noted]

Last modification: November 2, 2007

Year	Unit value (\$/t)	% Change	Convert to Positive
1932	6.92	-8.95%	0.91
1933	6.92	0.00%	1.00
1934	7.89	14.02%	1.14
1935	8.03	1.77%	1.02
1936	7.92	-1.37%	0.99
1937	8.04	1.52%	1.02
1938	7.95	-1.12%	0.99
1939	7.79	-2.01%	0.98
1940	7.66	-1.67%	0.98
1941	7.79	1.70%	1.02
1942	8.01	2.82%	1.03
1943	8.20	2.37%	1.02
1944	8.29	1.10%	1.01
1945	8.55	3.14%	1.03
1946	9.39	9.82%	1.10
1947	10.40	10.76%	1.11
1948	11.40	9.62%	1.10
1949	12.10	6.14%	1.06
1950	12.30	1.65%	1.02
1951	12.90	4.88%	1.05
1952	13.00	0.78%	1.01
1953	12.80	-1.54%	0.98
1954	13.00	1.56%	1.02
1955	13.40	3.08%	1.03
1956	14.10	5.22%	1.05
1957	14.50	2.84%	1.03
1958	14.50	0.00%	1.00
1959	14.50	0.00%	1.00

**LIME STATISTICS<sup>1</sup>**  
**U.S. GEOLOGICAL SURVEY**

[All values in metric tons (t) lime unless otherwise noted]  
 Last modification: November 2, 2007

Year	Unit value (\$/t)	% Change	Convert to Positive
1960	14.70	1.38%	1.01
1961	14.80	0.68%	1.01
1962	15.00	1.35%	1.01
1963	15.10	0.67%	1.01
1964	15.30	1.32%	1.01
1965	15.30	0.00%	1.00
1966	14.60	-4.58%	0.95
1967	14.80	1.37%	1.01
1968	14.80	0.00%	1.00
1969	15.40	4.05%	1.04
1970	16.30	5.84%	1.06
1971	17.50	7.36%	1.07
1972	18.60	6.29%	1.06
1973	19.20	3.23%	1.03
1974	24.30	26.56%	1.27
1975	30.30	24.69%	1.25
1976	33.30	9.90%	1.10
1977	36.90	10.81%	1.11
1978	40.50	9.76%	1.10
1979	45.50	12.35%	1.12
1980	49.00	7.69%	1.08
1981	51.80	5.71%	1.06
1982	54.50	5.21%	1.05
1983	56.30	3.30%	1.03
1984	56.40	0.18%	1.00

LIME STATISTICS<sup>1</sup>  
U.S. GEOLOGICAL SURVEY

[All values in metric tons (t) lime unless otherwise noted]  
Last modification: November 2, 2007

Year	Unit value (\$/t)	% Change	Convert to Positive
1985	57.00	1.06%	1.01
1986	57.90	1.58%	1.02
1987	55.20	-4.66%	0.95
1988	53.00	-3.99%	0.96
1989	54.90	3.58%	1.04
1990	57.10	4.01%	1.04
1991	57.00	-0.18%	1.00
1992	58.80	3.16%	1.03
1993	57.40	-2.38%	0.98
1994	58.60	2.09%	1.02
1995	59.50	1.54%	1.02
1996	61.50	3.36%	1.03
1997	61.00	-0.81%	0.99
1998	60.30	-1.15%	0.99
1999	60.40	0.17%	1.00
2000	60.60	0.33%	1.00
2001	61.30	1.16%	1.01
2002	62.60	2.12%	1.02
2003	64.80	3.51%	1.04
2004	68.80	6.17%	1.06
2005	75.00	9.01%	1.09
2006	81.20	8.27%	1.08
Arithmetic mean:		3.23%	3.23%
Geometric mean:		N/A	2.98%

<sup>1</sup>Compiled by T.G. Goonan and M.M. Miller.  
Data are calculated, estimated, or reported. See notes for more information.



Lehman Brothers U.S. Government/Credit Index  
Source: LehmanLive Website

Full Name	Value Date	Return Type	YTD Total Return	Percent Change	Convert to Positive
U.S. Government/Credit	12/31/1973	Unhedged	2.298562	0.02298562	1.02298562
U.S. Government/Credit	12/31/1974	Unhedged	0.173907	0.00173907	1.00173907
U.S. Government/Credit	12/31/1975	Unhedged	12.291278	0.12291278	1.12291278
U.S. Government/Credit	12/31/1976	Unhedged	15.584238	0.15584238	1.15584238
U.S. Government/Credit	12/30/1977	Unhedged	2.994655	0.02994655	1.02994655
U.S. Government/Credit	12/29/1978	Unhedged	1.167421	0.01167421	1.01167421
U.S. Government/Credit	12/31/1979	Unhedged	2.279569	0.02279569	1.02279569
U.S. Government/Credit	12/31/1980	Unhedged	3.04756	0.0304756	1.0304756
U.S. Government/Credit	12/31/1981	Unhedged	7.286263	0.07286263	1.07286263
U.S. Government/Credit	12/31/1982	Unhedged	31.097855	0.31097855	1.31097855
U.S. Government/Credit	12/30/1983	Unhedged	7.987689	0.07987689	1.07987689
U.S. Government/Credit	12/31/1984	Unhedged	15.00544	0.1500544	1.1500544
U.S. Government/Credit	12/31/1985	Unhedged	21.325217	0.21325217	1.21325217
U.S. Government/Credit	12/31/1986	Unhedged	15.599849	0.15599849	1.15599849
U.S. Government/Credit	12/31/1987	Unhedged	2.303383	0.02303383	1.02303383
U.S. Government/Credit	12/30/1988	Unhedged	7.587892	0.07587892	1.07587892
U.S. Government/Credit	12/29/1989	Unhedged	14.228355	0.14228355	1.14228355
U.S. Government/Credit	12/31/1990	Unhedged	8.292586	0.08292586	1.08292586
U.S. Government/Credit	12/31/1991	Unhedged	16.125458	0.16125458	1.16125458
U.S. Government/Credit	12/31/1992	Unhedged	7.584939	0.07584939	1.07584939
U.S. Government/Credit	12/31/1993	Unhedged	11.03181	0.1103181	1.1103181
U.S. Government/Credit	12/30/1994	Unhedged	-3.509601	-0.03509601	0.96490399
U.S. Government/Credit	12/29/1995	Unhedged	19.242709	0.19242709	1.19242709
U.S. Government/Credit	12/31/1996	Unhedged	2.90357	0.0290357	1.0290357
U.S. Government/Credit	12/31/1997	Unhedged	9.757223	0.09757223	1.09757223
U.S. Government/Credit	12/31/1998	Unhedged	9.472479	0.09472479	1.09472479
U.S. Government/Credit	12/31/1999	Unhedged	-2.147122	-0.02147122	0.97852878
U.S. Government/Credit	12/29/2000	Unhedged	11.851169	0.11851169	1.11851169
U.S. Government/Credit	12/31/2001	Unhedged	8.502578	0.08502578	1.08502578
U.S. Government/Credit	12/31/2002	Unhedged	11.035881	0.11035881	1.11035881
U.S. Government/Credit	12/31/2003	Unhedged	4.668455	0.04668455	1.04668455
U.S. Government/Credit	12/31/2004	Unhedged	4.193423	0.04193423	1.04193423
U.S. Government/Credit	12/30/2005	Unhedged	2.369024	0.02369024	1.02369024
U.S. Government/Credit	12/29/2006	Unhedged	3.778366	0.03778366	1.03778366
U.S. Government/Credit	12/31/2007	Unhedged	7.226425	0.07226425	1.07226425

Arithmetic mean: 8.42%  
Geometric mean: 8.20%

Lehman Brothers U.S. Aggregate Index  
 Source: LehmanLive Website

Full Name	Value Date	Return Type	YTD Total Return	Percent Change	Convert to Positive
U.S. Aggregate	12/31/1976	Unhedged	15.595498	0.15595498	1.15595498
U.S. Aggregate	12/30/1977	Unhedged	3.02538	0.0302538	1.0302538
U.S. Aggregate	12/29/1978	Unhedged	1.398805	0.01398805	1.01398805
U.S. Aggregate	12/31/1979	Unhedged	1.924445	0.01924445	1.01924445
U.S. Aggregate	12/31/1980	Unhedged	2.707597	0.02707597	1.02707597
U.S. Aggregate	12/31/1981	Unhedged	6.261099	0.06261099	1.06261099
U.S. Aggregate	12/31/1982	Unhedged	32.635016	0.32635016	1.32635016
U.S. Aggregate	12/30/1983	Unhedged	8.373009	0.08373009	1.08373009
U.S. Aggregate	12/31/1984	Unhedged	15.153796	0.15153796	1.15153796
U.S. Aggregate	12/31/1985	Unhedged	22.125676	0.22125676	1.22125676
U.S. Aggregate	12/31/1986	Unhedged	15.24882	0.1524882	1.1524882
U.S. Aggregate	12/31/1987	Unhedged	2.756946	0.02756946	1.02756946
U.S. Aggregate	12/30/1988	Unhedged	7.878508	0.07878508	1.07878508
U.S. Aggregate	12/29/1989	Unhedged	14.529286	0.14529286	1.14529286
U.S. Aggregate	12/31/1990	Unhedged	8.945261	0.08945261	1.08945261
U.S. Aggregate	12/31/1991	Unhedged	16.000538	0.16000538	1.16000538
U.S. Aggregate	12/31/1992	Unhedged	7.402604	0.07402604	1.07402604
U.S. Aggregate	12/31/1993	Unhedged	9.749142	0.09749142	1.09749142
U.S. Aggregate	12/30/1994	Unhedged	-2.916151	-0.02916151	0.97083849
U.S. Aggregate	12/29/1995	Unhedged	18.473766	0.18473766	1.18473766
U.S. Aggregate	12/31/1996	Unhedged	3.630583	0.03630583	1.03630583
U.S. Aggregate	12/31/1997	Unhedged	9.653966	0.09653966	1.09653966
U.S. Aggregate	12/31/1998	Unhedged	8.686512	0.08686512	1.08686512
U.S. Aggregate	12/31/1999	Unhedged	-0.821319	-0.00821319	0.99178681
U.S. Aggregate	12/29/2000	Unhedged	11.626067	0.11626067	1.11626067
U.S. Aggregate	12/31/2001	Unhedged	8.443473	0.08443473	1.08443473
U.S. Aggregate	12/31/2002	Unhedged	10.25503	0.1025503	1.1025503
U.S. Aggregate	12/31/2003	Unhedged	4.104447	0.04104447	1.04104447
U.S. Aggregate	12/31/2004	Unhedged	4.338787	0.04338787	1.04338787
U.S. Aggregate	12/30/2005	Unhedged	2.428532	0.02428532	1.02428532
U.S. Aggregate	12/29/2006	Unhedged	4.333766	0.04333766	1.04333766
U.S. Aggregate	12/31/2007	Unhedged	6.966623	0.06966623	1.06966623
Arithmetic mean:				8.78%	8.78%
Geometric mean:					8.55%