



# Public Service Commission

## State of North Dakota

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## Memorandum

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**TO:** Mine Operators, Lignite Energy Council, and Other Interested Parties

**FROM:** <sup>JE</sup> Jonathan Emmer, Director - Reclamation Division  
<sup>BM</sup> Brandon Myran, Environmental Engineer - Reclamation Division

**DATE:** March 27, 2024

**SUBJECT:** Revised Annual update of variable costs contained in Policy Memorandum No. 16 to Mine Operators - Reclamation Cost Estimating Guidelines

Attached is the July 2023 variable cost update with the updated fuel consumption rates to the Reclamation Division's Reclamation Cost Estimating Guidelines used for calculating worst-case bond amounts for mining permits. This update contains the variable costs as of July 1, 2023 with the updated fuel consumption rates. Several of the variable cost items changed with this update and the average hourly rates for equipment used at the large mines increased an average of 9.61% over the July 1, 2022 rates. The attachment includes a breakdown of the hourly equipment rates for 2023. A comparison of the 2022 and 2023 hourly equipment rates is also attached for your convenience.

**For any new or pending revision applications that propose a new or revised worst-case reclamation scenario, mining companies will need to include the revised 2023 variable costs.** If you believe the worst-case reclamation condition described in the current reclamation cost estimate has passed, please contact us and we will review that cost estimate to determine if any changes are needed.

The equipment list prices and suggested residual values were obtained from Butler Machinery. The fuel cost, an average weekly cost over the past 12 months, was obtained from Fleet Services with the North Dakota Department of Transportation. Tire prices are based on information received from Pomp's Tire Service and Lignite Tire Service. Seed prices are based on information received from Chesak Seed House and custom work farm rates are based on 2020 average rates published by the NDSU Extension Service.

For small mines, the rate will not change from the \$1.47 per cubic yard since no bids were received by the Commission's AML Division this year. No updates to the worst-case reclamation cost estimates will be required this year for small mines.

### Attachments

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**Per Cubic Yard Earth-moving Cost for Small Mines**

Costs for backfilling, grading, and suitable plant growth material respread where the total quantity to be moved is 500,000 cubic yards or less will be calculated at a rate of \$1.47 per cubic yard. (This rate will be reviewed and updated on July 1 of each year.)

**Equipment Prices**

The following equipment prices were furnished on July 24, 2023 by Tyler Freuer of Butler Machinery as the current list price delivered as commonly equipped for reclamation work. These prices include a 5% discount and no taxes.

<b><u>Item</u></b>	<b><u>List Price Discounted (\$)</u></b>
D11T Tractor w/U Dozer & Ripper	3,230,000
D10T Tractor w/U Dozer & Ripper	2,100,000
D9T Tractor w/U Dozer & Ripper	1,530,000
657G Scraper w/Push-Pull	2,320,000
637G Scraper w/Push-Pull	1,650,000
993K Wheel Loader with 15 CY Bucket	3,850,000
777F End Dump Truck	2,250,000
16M Motor Grader w/Ripper	1,360,000

**Replacement Tire Prices**

The following tire prices are the average cost based on information provided by Lignite Tire Service on July 14, 2023 and Pomp's Tire Service on October 23, 2023. Lignite Tire Service did not provide a quote for a 37.25 R35(E-3) tire.

<b><u>Equipment</u></b>	<b><u>Tire Size</u></b>	<b><u>Price Each (\$)</u></b>
657G Scraper	40.5/75 R39 (E-3)	22,335
637G Scraper	37.25 R35 (E-3)	18,187
16M Motor Grader	23.5 R25 (E-4)	5,038
993K Wheel Loader	50/65 R51 (L-5)	81,657
777F End Dump Truck	27.00 R49 (E-4)	17,584

**Residual Values for Reclamation Equipment**

The following are residual percentages and values to be used for determining the cost per hour of reclamation equipment. Values shown were obtained from Butler Machinery.

<b><u>Item</u></b>	<b><u>Percentage of Original Cost</u></b>	<b><u>Residual Value (\$)</u></b>
D11T Tractor w/U Dozer & Ripper	40	1,292,000
D10T Tractor w/U Dozer & Ripper	50	1,050,000
D9T Tractor w/U Dozer & Ripper	50	765,000
657G Scraper w/Push-Pull	40	928,000
637G Scraper w/Push-Pull	50	825,000
16M Motor Grader w/Ripper	60	816,000
993K Wheel Loader W/15 CY Bucket	40	1,540,000
777F End Dump Truck	50	1,125,000

**Prime Interest Rate**

The prime interest rate to be used for the calculation of interest on reclamation equipment under this update is 8.50% for July 1, 2023 to June 30, 2024. The total interest rate to be used for calculations is 10.50% as determined according to item III(A) of this guideline.

**Fuel Cost**

The cost of fuel for reclamation equipment from July 1, 2023 to June 30, 2024 is based on the average retail price from June 1, 2022 to June 30, 2023 obtained from the Fleet Services Division of the the North Dakota Department of Transportation is \$3.401 per gallon. Federal and state taxes are excluded from this price.

**Wages and Benefits**

Wage rates effective May 1, 2023 through April 30, 2024 were obtained from the International Union of Operating Engineers Local 49. Rates for workers compensation, unemployment benefits, and social security were obtained from the applicable North Dakota state agencies.

Hourly Rate for Labor - Group 3 Heavy Industrial	35.85
Pension, Health, Welfare, & Apprenticeship/Hour - Group 3	22.50
Insurance - Assumed 1% of Hourly Rate	0.36
Social Security - 7.65% of Hourly Rate	2.74
*Workers Compensation – 0.795% of Hourly Rate	0.29
$[\$444.72 / (\$35.85 \times 2080 \text{ hrs} \times 0.75)] = 0.00795 \text{ or } 0.795\%$	
*Unemployment – 7.3% of Hr. Labor	2.61
$[(0.0997 \times \$40,800) / (\$35.85 \times 2080 \text{ hrs} \times 0.75)] = 0.0727$	
Total Hourly Operator Cost (*based on 40-hour week, 9 months per year)	64.35

### **Custom Farm Work Rates**

The following custom farm rates are taken from the publication "2020 North Dakota Custom Rates Part I – Early Season Operations" (August 2020) published by the NDSU Extension Service.

<b><u>Item</u></b>	<b><u>Rate/Acre (\$)</u></b>
Chisel Plowing	11.30
Small Grain Seeding	14.28
Application of Dry Fertilizer	6.98

### **Fertilizer**

The cost of 11-52-0 fertilizer for use in reclamation is \$825 per ton. This price is based on the rate provided by Hefty Seed Company on October 20, 2023.

### **Trees**

The cost of planting trees and shrubs on reclaimed land is based on rates obtained from the Mercer County Soil Conservation District, Beulah, ND. Price includes planting.

Trees:	\$50/100 feet
Weed Fabric Barrier:	\$90/100 feet

## Seed

All seed prices were provided by Chesak Seed House on July 12, 2023 besides Sand Bluestem which was provided on October 23, 2023. Seed prices are highly variable and may not reflect prices of seed later this year or next spring.

<u>Native Variety</u>	<u>\$/lb (PLS)</u>	<u>Introduced Variety</u>	<u>\$/lb (PLS)</u>
Big bluestem	9.10	Crested wheatgrass	3.85
Blue Grama	22.10	Intermediate wheatgrass	3.85
Canada wildrye	4.55	Pubescent wheatgrass	3.85
Green needlegrass	3.90	Russian wildrye	10.73
Indian grass	9.80	Smooth brome grass	5.39
Little bluestem	10.40	Tall wheatgrass	1.93
Prairie sandreed	23.10	<u>Legumes</u>	
Reed canarygrass	7.35	Alfalfa	3.05
Sand bluestem	21.00	Sweetclover (yellow)	4.12
Sideoats grama	13.20	Sweetclover (white)	3.85
Slender wheatgrass	3.50		
Switchgrass	3.50		
Buffalo grass	31.20		
Thickspike wheatgrass	7.84		
Western wheatgrass	8.00		
Prairie Junegrass	36.40		

### Hourly Cost Estimation 2024 - Large Mine Fleet

Estimated Ownership yrs =	7	Insurance rate =	0.0075	Fuel Cost/gal \$ =	3.40
Annual Use hrs =	3,000	Sales Tax rate =	0.05	Union Labor - Group 3 base =	35.85
Total Life hrs/years =	20,000	Unemploymt constructn rate =	0.0997	Union Labor - Group 3 total =	58.35
Interest rate =	0.105	Unemploymt salary cap =	40,800	WSI Premium Charge =	444.72

Equipment Type	Dozers			Scrapers		Grader	Water wagon	Loader	Truck
	D11T	D10T	D9T	657G	637G	16M		993K	777F
<b>Ownership Costs:</b>									
Delivered price \$	3,230,000	2,100,000	1,530,000	2,320,000	1,650,000	1,360,000	1,360,000	3,850,000	2,250,000 disc 5%
Tire replacement \$	0	0	0	89,340	72,746	30,230	30,230	326,628	105,503
Adjusted price \$	3,230,000	2,100,000	1,530,000	2,230,660	1,577,254	1,329,770	1,329,770	3,523,372	2,144,497
Residual Value \$	1,292,000	1,050,000	765,000	928,000	825,000	816,000	816,000	1,540,000	1,125,000
Residual Value %	40	50	50	40	50	60	60	40	50
Value to be recovered \$	1,938,000	1,050,000	765,000	1,302,660	752,254	513,770	513,770	1,983,372	1,019,497
Equipment cost per hour \$	96.90	52.50	38.25	65.13	37.61	25.69	25.69	99.17	50.97
Interest cost \$/hr	64.60	42.00	30.60	46.40	33.00	27.20	27.20	77.00	45.00
Insurance cost \$/hr	4.61	3.00	2.19	3.31	2.36	1.94	1.94	5.50	3.21
Sales tax cost \$/hr	8.08	5.25	3.83	5.80	4.13	3.40	3.40	9.63	5.63
<b>Hourly ownership cost</b>	<b>174.19</b>	<b>102.75</b>	<b>74.86</b>	<b>120.65</b>	<b>77.09</b>	<b>58.23</b>	<b>58.23</b>	<b>191.29</b>	<b>104.81</b>
<b>Operating Costs:</b>									
Fuel consumption gal/hr	22.8	16.3	11.7	26.1	23.6	4.7	4.7	23.1	12.1 CPH 49
Fuel cost \$/hr	77.54	55.44	39.79	88.77	80.26	15.98	15.98	78.56	41.15
Lubricants \$/hr	10.82	7.81	6.76	14.87	10.53	2.80	2.80	13.40	10.26 disc 45%
Tire life hrs	0	0	0	5,000	5,000	10,000	10,000	10,000	10,000
Tire cost \$/hr	0.00	0.00	0.00	17.87	14.55	3.02	3.02	32.66	10.55
Overhaul \$	70.51	47.21	38.30	57.24	42.61	11.17	11.17	26.52	38.73 disc 45%
Repair + maintenance	70.74	48.04	39.16	64.64	49.89	10.27	10.27	29.91	23.85 disc 45%
Wear items, GEC	9.75	5.97	4.68	1.85	1.22	0.57	0.57	3.15	0.00 disc 45%
<b>Hourly operating cost</b>	<b>239.35</b>	<b>164.46</b>	<b>128.69</b>	<b>245.24</b>	<b>199.06</b>	<b>43.81</b>	<b>43.81</b>	<b>184.21</b>	<b>124.54</b>
<b>Operators hourly wage (\$)</b>	<b>64.35</b>	<b>64.35</b>	<b>64.35</b>	<b>64.35</b>	<b>64.35</b>	<b>64.35</b>	<b>64.35</b>	<b>64.35</b>	<b>64.35</b>
<b>Total hourly rate</b>	<b>477.89</b>	<b>331.56</b>	<b>267.90</b>	<b>430.23</b>	<b>340.51</b>	<b>166.39</b>	<b>166.39</b>	<b>439.85</b>	<b>293.70</b>
<b>Overhead and profit @15%</b>	<b>71.68</b>	<b>49.73</b>	<b>40.19</b>	<b>64.53</b>	<b>51.08</b>	<b>24.96</b>	<b>24.96</b>	<b>65.98</b>	<b>44.06</b>
<b>Total Estimated Hourly Cost:</b>	<b>549.58</b>	<b>381.29</b>	<b>308.09</b>	<b>494.77</b>	<b>391.58</b>	<b>191.35</b>	<b>191.35</b>	<b>505.83</b>	<b>337.76</b>

**2022 - 2023 Variable Costs: Summary of Changes**

	Dozers			Scrapers		Grader	Water	Loader	Truck
	D11T	D10T	D9T	657G	637G	16M	wagon	993K	777F
Total Estimated Hourly Cost (\$)									
2022	479.12	344.88	286.08	460.70	357.85	184.92	184.92	419.42	309.54
2023	549.58	381.29	308.09	494.77	391.58	191.35	191.35	505.83	337.76
Change (\$)	70.45	36.41	22.01	34.07	33.73	6.43	6.43	86.41	28.22
Change (%)	14.7	10.6	7.7	7.4	9.4	3.5	3.5	20.6	9.1
<b>Total Average Change 2022 - 2023 (%)</b>	<b>9.61</b>								

**PSC Reclamation Division Worksheet: 2023 Residual Values for Equipment**

The following table gives estimated heavy equipment values (Caterpillar or equivalent) that are 7 years old with approximately 20,000 hours of operation. Equipment is assumed to have been maintained on a regular schedule and is in working condition. No allowance has been made for inflation, as used equipment values can fluctuate considerably due to condition, location, and market.

<i>Year</i>	<i>2021</i>			<i>2022</i>			<i>2023</i>		
<b>MODEL</b>	<b>COST 5% Discount No Taxes</b>	<b>%</b>	<b>RESIDUAL VALUE</b>	<b>COST 5% Discount No Taxes</b>	<b>%</b>	<b>RESIDUAL VALUE</b>	<b>COST 5% Discount No Taxes</b>	<b>%</b>	<b>RESIDUAL VALUE</b>
<b>DOZERS</b>									
D 11T	2,910,000	50	1,455,000	2,980,000	50	1,490,000	3,230,000	40	1,292,000
D 10T	1,920,000	50	960,000	1,980,000	50	990,000	2,100,000	50	1,050,000
D 9T	1,370,000	50	685,000	1,420,000	48	685,000	1,530,000	50	765,000
<b>SCRAPERS</b>									
657G	2,272,000	50	1,136,000	2,320,000	50	1,160,000	2,320,000	40	928,000
637G	1,570,000	50	785,000	1,610,000	50	805,000	1,650,000	50	825,000
<b>MOTOR GRADER</b>									
16M	1,230,000	50	615,000	1,270,000	50	635,000	1,360,000	60	816,000
<b>LOADER</b>									
993 K	3,500,000	50	1,750,000	3,570,000	50	1,785,000	3,850,000	40	1,540,000
<b>END DUMP</b>									
777F	2,200,000	50	1,100,000	2,250,000	56	1,250,000	2,250,000	50	1,125,000