



Consulting Engineers & Planners

OUR FILE: 9100-51-1

YOUR FILE:

22 July 1982

The Regional Municipality of Halton
P.O. Box 7000
1151 Bronte Road
Oakville, Ontario
L6J 6E1

RECEIVED

28 JUL 1982

HALTON REGION
PUBLIC WORKS

Attention: D.J. Corbett, P.Eng.
Waste Disposal Engineer

Burlington and Oakville Landfill
Sites - Capacity Updates

Dear Sirs:

Site capacity updates and volume utilization calculations for the Burlington and Oakville landfill sites based on 7 November 1981, and 15 April 1982 photography are now complete. The base data was prepared by Northway-Gestalt and reviewed by Dillon. Study results obtained are summarized as follows:

- | | | |
|----|---------------------------------------|-----------------------|
| A. | Burlington | |
| | Refuse density achieved (Phase I) | 673 kg/m ³ |
| | Refuse to cover ratio (Phase I) | 10.9:1 |
| | Estimated site closure (Phase I & II) | March/April 1984 |
| | Future fill required (Phase I & II) | 72,440 m ³ |
| B. | Oakville | |
| | Refuse density achieved | 595 kg/m ³ |
| | Refuse to cover ratio | 8.8:1 |
| | Estimated site closure | October 1982 |
| | Future fill required | 29,200 m ³ |

Detailed outlines of the calculations undertaken for each site are attached for your information.

Refuse densities at both sites appear to be lower than previously estimated. The refuse to cover ratios also indicate that much less fill is being used for intermediate and daily cover. This may be partially attributed to inaccurate field estimates of the fill quantities trucked in to the sites. Both

...continued

DILLON

Regional Municipality
of Halton

- 2 -

22 July 1982

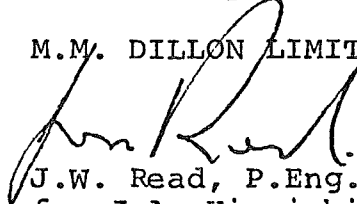
the lower densities and varying refuse to cover ratios, however, are probably largely characteristic of winter time operations.

Site closure dates appear to be in line with the February 1982 estimates. Changes to the refuse to cover ratios and refuse densities were examined to determine their impact on site lives. No significant variations resulted.

We trust the foregoing is satisfactory. If you have any questions, please call.

Yours truly,

M.M. DILLON LIMITED



J.W. Read, P.Eng.
for J.A. Hiraishi, P.Eng.
Project Manager

JWR:kb

A. BURLINGTON LANDFILL

A.1 Volume Utilization - Phase I

Total volume used between photos 54,351 m³

Net fill used

i)	from previous stockpiles	7492 m ³	
ii)	fill trucked in (less 50% for on-site compaction)	3620 m ³	
iii)	less fill left in stockpile	(5733 m ³)	
	Gross fill used	5379 m ³	
	Less 15% for losses (infilling of refuse voids etc.)	(807 m ³)	
	Total net filled used	4572 m ³	(4,572 m ³)

Refuse volume49,779 m³

Waste received at site = 33,513 tonnes
Density achieved = 673 kg/m³

A.2 Refuse: Cover Ratio - Phase I

From above;

49,779 m³ refuse: 4,572 m³ net fill
or 10.9:1 refuse to cover

(assumed no final cover applied between photos).

A.3 Remaining Capacity - Phase I & II

Volume remaining to final contours	703,314 m ³
Less 0.6m final cover	(81,450 m ³)
Refuse, intermediate and daily cover	621,864 m ³
Less cover at 3:1 refuse to cover ratio	(155,466 m ³)
Refuse volume available	466,398 m ³
Refuse tonnage capacity (assuming 700 kg/m ³ density*)	326,480 tonnes
Average rate of fill** (1982-1984)	14,120 $\frac{\text{tonnes}}{\text{month}}$
Remaining operating life	23.1 months

Estimated site closure - March 1984

- * Density calculated from November 1981 data = 742 kg/m³
Density calculated from April 1982 data = 673 kg/m³
Average = 707 kg/m³
Therefore use 700 kg/m³

- ** Assumptions; Oakville waste will be redirected to Burlington in November 1982. Waste quantities based on projecting 1981 data by 2.5%/year.

If the refuse to cover ratio is changed to 4:1 the estimated site closure would be April 1984.

A.4 Future Fill Required - Phase I & II

Final cover at 0.6m	81,450 m ³
Intermediate and daily cover (3:1 refuse to cover ratio)	155,460 m ³
Less fill available in current stockpiles (not including Phase II's topsoil stockpile)	(8,350 m ³)
Total fill required	228,570 m ³

Fill available from future Phase II excavations (including 15% bulking factor) amounts to 156,130 m³.

Therefore there will be a fill deficit.

$$\underline{\text{Future fill required}} = 72,440 \text{ m}^3$$

Should a 4:1 refuse to cover ratio be obtained the future fill required would be reduced to 41,340 m³.

B OAKVILLE LANDFILL

B.1 Volume Utilization

Total volume used between photos 73,555 m³

Net fill used

i)	from previous stockpiles	8,218 m ³	
ii)	fill trucked in (less 50% for on-site compaction)	5,015 m ³	
iii)	less fill left in stockpiles	<u>(4,433 m³)</u>	
	Gross fill used	8,800 m ³	
	Less 15% for losses (infilling of refuse voids etc.)	<u>(1,320 m³)</u>	
	Total net fill used	7,480 m ³	<u>(7,480 m³)</u>

Refuse volume..... 66,075 m³

Waste received at site = 39,319 tonnes

Density achieved = 595 kg/m³

B.2 Refuse: Cover Ratio

From above;

66,075 m³ refuse: 7,480 m³ net fill

or 8.8:1 refuse to cover

(assumed no final cover applied between photos)

B.3 Remaining Capacity

Volume remaining to final contours	110,750 m ³
Plus proposed excavation	31,737 m ³
Less 0.6m final cover	(35,580 m ³)
Refuse, intermediate and daily cover	106,907 m ³
Less cover at 3:1 refuse to cover ratio	(26,727 m ³)
Refuse volume available	80,180 m ³
Refuse tonnage capacity (assuming 650 kg/m ³ density*)	52,120 tonnes
Rate of fill in 1982 (assuming 1981 average increases by 2.5%)	8,461 <u>tonnes</u> month
Remaining operating life	6.2 months

Estimated site closure - October 1982

- * Density calculated from November 1981 data = 695 kg/m³
- Density calculated from April ¹⁹⁸²~~1981~~ data = 595 kg/m³
- Average = 645 kg/m³
- Therefore use 650 kg/m³

If the refuse to cover ratio is changed to 4:1 the remaining operating life increases to 6.6 months. The estimated site closure will essentially remain the same with some minor capacity available in November 1982.

B.4 Future Fill Required

Final cover at 0.6m	42,400m ³ *
Intermediate and daily cover (3:1 refuse to cover ratio)	26,730m ³
Less fill available in stockpiles	(4,433m ³)
Less future excavation (includes 15% bulking factor)	(36,500m ³)
Plus material required for clay dyke	1,000 m ³
<u>Future fill required =</u>	29,200m ³

* This number may increase, thereby increasing the future fill required, should other areas than assumed still need final cover.

Should a 4:1 refuse to cover ratio be obtained the future fill required would be reduced to 23,850m³.