

RESPONSE 20

Table 3: Temple RDF – Waste Volume Equipment Schedule

Equipment Type	Waste Acceptance Rate (Tons Per Year)			Minimum Size ⁽¹⁾	Function
	Less Than 350,000	350,001 to 750,000	750,001 to 1,250,000		
Compactor	1	1	2	40,000 lb.	Waste spreading and compaction, fire protection
Bulldozer	1	2	2	140 horsepower	Movement and placement of soil, waste spreading and compaction, fire protection
Excavator ⁽²⁾⁽⁴⁾	1	1	1	2.5 cy bucket	Excavation of soil, fire protection
Haul Truck ⁽²⁾⁽⁴⁾	1	2	2	20 cy	Hauling of soil, fire protection
Motor Grader	1	1	1	12-ft blades	Grading of access roads
Water Truck	1	1	1	1,500 gallons	Dust control, fire protection
Temporary Litter Fencing	1	3	4	four feet high	Active face litter control
Rotary Broom Sweeper	1	1	1	4-ft broom width	Road maintenance (cleaning)
Landfill Manager	1	1	1	N/A	See Section 2.0 – Personnel
Equipment Operator	1	3	4	N/A	See Section 2.0 – Personnel
Gate Attendant	1	2	2	N/A	See Section 2.0 – Personnel
Laborer	0	3	4	N/A	See Section 2.0 – Personnel
Pump	1	1	1	NA	Storm water removal

Notes:

(1) The equipment size is the minimum size to be provided.

(2) The equivalent function of an excavator and haul truck(s) working in tandem to excavate and transport soil may be met by a scraper. Thus, at the facility's discretion, the excavator and haul truck(s) may be replaced by a scraper(s) that provides equivalent production rates.

(3) In the event of equipment breakdown or maintenance, backup equipment will be provided from other landfills, or from independent contractors or local rental companies, to avoid interruption of waste services and required facility operations.

(4) Equipment necessary to address firefighting concerns may require an increase in the amount of equipment listed in the table. As demonstrated in Appendix IVC, the existing equipment has adequate capacity to spread a 6-inch layer of earthen material on the largest working face within one hour of detecting a fire. To ensure adequate soil is available for spreading, stockpiles near the working face will be maintained to supplement the hauling capacity of the existing equipment when a large working face is operated (see Table 1 of Appendix IVC), unless additional equipment is available.

FIRE PROTECTION EQUIPMENT CAPACITY

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1.0 OBJECTIVE

Evaluate the adequacy of the on-site equipment to place a 6-inch layer of earthen material within 1 hour of detecting a fire on the working face area that is not already covered. Evaluate the capacity of the equipment to haul soil from a borrow area 1,000 feet away and for a bulldozer to spread the soil over the open area. The equipment to be evaluated includes excavators, each with a 4-cubic yard (cy) bucket, dump trucks, each with a 20-cy capacity, and CAT D8 bulldozers. The equipment being evaluated is typical and may be replaced with equivalent equipment of a different brand or size.

2.0 ASSUMPTIONS

- I) A working face size for a typical operation is 10,000 ft² (100 feet by 100 feet), but at maximum may be as much as 80,000 ft² (400 feet by 200 feet).
- II) Volume of working face with 6-inch layer, including an additional 20%, ranges from approximately 222 cy for a 10,000 ft² working face to 1,778 cy for an 80,000 ft² working face. This material is stockpiled adjacent to the working face and used for daily cover.
- III) Distance to earthen material borrow area is 1,000-feet.
- IV) Time to cover working face is 1 hour (60 minutes).
- V) Bulldozer will be used at the working face for spreading.
- VI) The site currently has one (1) excavator, two (2) dump trucks, and two (2) bulldozers. The capacity of these pieces of equipment will be first evaluated for adequacy. Additional operating requirements, if needed are provided.

2.1 Equipment Specs

2.1.1 Excavator

Estimated per Reference 1, using the CAT 345D L-VG excavator specifications (p. 4-19) and time cycle charts (p. 4-189).

Bucket Volume (heaped)	4 cy
Load Bucket	0.13 min
Swing Loaded	0.07 min
Dump Bucket	0.02 min
Swing Empty	0.06 min
Cycle Time per Load	0.28 min



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2.1.2 Dump Truck

Estimated per Reference 1, using the CAT 770 truck specifications (p. 9-3) and travel time charts (p. 9-18).

Dump Capacity	20 cy	
Loading Time = (Dump Truck Capacity / Excavator Bucket Volume) * Excavator Cycle Time		
Loading Time	1.4 min	
Hauling Time (10%grade)	1.2 min	
Dumping Time	0.5 min	(Assumed)
Return Time (10% grade)	0.6 min	

3.0 CALCULATIONS

3.1 Excavators and Dump Trucks

Excavator

Cycle Time = 0.28 minutes

Bucket Volume = 4 cy

Total Volume in 60 minutes = 856 cy

Dump Truck

Cycle Time = Load + Haul + Dump + Return

Cycle Time (per truck) = 3.7 min

In 60 minutes:

Number of Loads (per truck) 16

Volume of Material (per truck) 320 cy

One (1) Excavator and Two (2) Dump Trucks

Total Volume in 60 minutes = 640 cy

The existing site equipment can haul up to 640 cy. In order to haul 1778 cy, the capacity required for an 80,000 ft² working face, additional equipment will be required. Alternatively, material can be stockpiled near the working face in order to provide adequate volume. Table 1 shows the stockpile volumes necessary to supplement the hauling capacity of the existing site equipment.

Table 1: Working Face Stockpiling Requirements

Working Face Area (ft ²)	Required Cover Material Volume (cy)	Hauling Capacity ¹ (cy)	Working Face Stockpile Requirement (cy)
10,000	222	640	0
20,000	444	640	0
30,000	667	640	27
40,000	889	640	249
50,000	1111	640	471
60,000	1333	640	693
70,000	1556	640	916
80,000	1778	640	1138

¹Hauling capacity of existing equipment (one excavator and two haul trucks)

3.2 CAT D8 Bulldozers

In an emergency fire situation, the bulldozers will push nearby soil already hauled and dumped next to the working face.

Average dozing distance assumed as 100 feet.

Dozer production = maximum production * correction factors:

Max production per D8 Dozer =	900	cy/hr	Ref. 1 (p. 1-47)
Loose stockpile, correction factor =	1.15		
Excellent Operator, correction factor =	1.00		
Production =	1035	cy/hr	

Total Soil handled by each bulldozer = 1035 cy/hr

Total Soil handled by two (2) bulldozers = 2070 cy/hr > 1778 cy

The existing bulldozers have adequate capacity to spread 1778 cy, the volume corresponding to the maximum working face area of 80,000 ft².

4.0 CONCLUSION

On-site bulldozers will be available to place a 6-inch layer of earthen material on the working face waste area within one hour of detecting a fire. Stockpiles near the working face should be maintained to supplement the hauling capacity of existing equipment when large working faces are being operated. The existing onsite excavator and haul trucks can haul 640 cy of soil to the working face within one hour. If additional soil volume is required, adequate soil needs to be stockpiled near the working face per Table 1. Alternatively, the site may add additional equipment.

5.0 REFERENCES

- 1) Caterpillar Performance Handbook, Edition 40, January 2010.