

Engineering Report (Checklist Item #5)

Route 5 Solid Waste Transfer Station

Prepared For:
Delaware Solid Waste Authority
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Attachments

- A Leachate/Facility Washdown Water Collection Piping and Storage Tank Technical Specifications
- B Calculations for Secondary Containment of Leachate/Facility Washdown Water

1.0 INTRODUCTION

The Delaware Solid Waste Authority (DSWA) plans to build and operate a solid waste transfer station on its property along Route 5 in Hollyville, Sussex County, Delaware. The transfer station will consist of approximately 30 acres, of which approximately 16 acres will be used for the layout of the transfer facility. The facility will serve both residential and commercial haulers and as designed will be capable of handling up to 1,920 tons per day of solid waste.

This Engineering Report serves to satisfy the requirements of DNREC's Solid Waste Regulations. This report describes the design features of the facility and outlines engineering controls implemented at the facility. This report is organized into sections as follows:

Section 1.0 Introduction: Describes the type of facility, and outlines the scope and organization of this Engineering Report.

Section 2.0 Site Description: Describes the proposed facility design and capacity, and includes applicable site drawings and specifications.

Section 3.0 Operational Procedures: Describes the facility procedures for traffic control and routing, truck tarping, and waste unloading.

Section 4.0 Nuisance Controls: Describes the proposed engineering controls to mitigate nuisances, such as odors, dust, and noise.

Section 5.0 Facility Leachate and Washdown Water Collection System: Describes the engineering controls designed to contain the release of leachate and washdown waters generated within the transfer station building.

Section 6.0 Site Security and Safety Measures: Describes the security and safety measures implemented at the Site to protect facility workers and the public.

Section 7.0 Emergencies: Describes the procedures for handling potential site emergencies, such as fires.

Section 8.0 Schedule: Describes the proposed schedule for the construction and operations start-up of the facility.

transfer trailers, commercial vehicles and pickups, and residential customers. These customers have separate traffic routes within the facility so that efficient and safe operations can be maintained. In addition, converging traffic patterns are controlled to minimize the potential for accidents. Traffic routing and signage may be temporarily modified from that shown on the engineering drawings to accommodate fluctuations in the makeup of incoming vehicles so that safe and efficient operations can be maintained and to minimize traffic queues. For example, Saturdays when big densities of residential vehicles come to the facility, weighmaster may periodically route selected vehicles to the commercial unloading area to maintain satisfactory queues.

After arriving at the site and passing over the scales, commercial and passenger vehicles will proceed in the dedicated access routes to the transfer station building and recycled materials drop off area. All solid waste handled at the transfer station will be weighed and accounted for using scales located at the scalehouse and/or in the transfer trailer loading area. The commercial vehicles will deposit their trash on the tipping floor through the main access, using one of the overhead rolling doors, while residential customers will deposit their trash onto the tipping floor through openings in the side of the building from the residential drop-off area located behind the office space. From the tipping floor trash will be loaded into the transfer trailers, which will be tarped at the tarping station outside of the building and transferred to a duly permitted solid waste facility.

A traffic queuing analysis was performed based on projected traffic volumes using actual incoming traffic count data at the DSWA's Southern Solid Waste Management Center (SSWMC). The queuing analysis was developed to model future conditions at the facility to account for projected growth in the waste stream and a related increase in vehicular traffic. The future condition was modeled consistent with the number and types of vehicles presently using the SSWMC. The queue analysis indicates that for inbound traffic, the maximum queue will occur

on a weekday and consist of 11 vehicles. The queue length required for this scenario is 176 feet, less than the more than 320 feet of available queue length at the facility. This analysis also indicates that there will be insignificant or no queues at the unloading areas and that outbound traffic will result in a queue of approximately 4 vehicles.

3.2 TARPING

All vehicles entering or leaving the facility will be tarped to control blowing litter both on and off-site. Generally, tarped vehicles entering the facility will untarp within the "truck parking area for tipping" (see Sheet A-2) or after stopping at the stop sign immediately before entering the truck maneuvering area (after crossing or passing the inbound scales). All transfer trailers will be tarped prior to leaving the site. Loaded transfer trailers leaving the site will utilize the tarping station at the exit of the transfer station loading pits. The tarping station is a drive-through location that includes elevated platforms around both sides of the trailers. The elevated platforms are accessed using stairways and include railings in accordance with OSHA standards. Should a loaded trailer be parked outside of the building overnight, an impermeable tarp will be used to prevent the entrance of precipitation.

3.3 TIPPING AND LOADING AREAS

Wastes will be unloaded onto the main tipping floor of the transfer station building. Waste will not be unloaded into a pit. DSWA employees or subcontracted operators will be responsible for directing traffic within the transfer building to ensure safety. Exterior doors allowing personnel and/or vehicle access to the tipping floor are limited to the area limited to the "truck parking area for tipping" (as noted on Sheet A-2). On a routine basis, waste will not be stored within the "truck parking area for tipping" during business hours.

The tipping floor of the building is a 15-inch thick reinforced concrete slab. The floor area is surrounded by a perimeter reinforced concrete wall, a minimum of 8 feet in height above the tipping floor. The purpose of this perimeter wall is to provide a location where waste can be piled and stored for future loading into transfer trailers. The push wall has been designed to accommodate the lateral loads that will result from the equipment used to load trailers. To minimize the accumulation of debris within the trailer loading area, steel chutes will be installed over the trailer-loading pit. The steel chutes overhang the trailer, and as such, direct waste into the transfer trailer. Any waste accumulated in any area other than the tipping floor will be removed in accordance with the facility's Plan of Operation.

4.0 NUISANCE CONTROL

The areas where municipal solid waste is handled include the tipping floor and the transfer trailer-loading pit. These areas are enclosed within the transfer station building. To minimize nuisance conditions from developing, the tipping and loading area of the transfer station building are located more than 300 feet from any commercial, institutional or residential structure designed for human occupancy.

To further minimize the opportunity for nuisance conditions, the orientation of the buildings was developed with the westerly prevailing wind direction in mind. Accordingly, the west elevation of the transfer station building provides truck access to the tipping floor, thereby mitigating the potential for off-site effects from noise, odor and dust. Additional measures, described below, are used to control other nuisances, such as the perimeter fence that will aid in the collection of blowing litter.

4.1 ODORS, DUST, AND AIR QUALITY

The most effective means of preventing/minimizing odors at a waste transfer station is good housekeeping. To minimize the presence of odors at the transfer stations, all waste will be removed from the facility on a daily basis and the tipping floor and trailer loading area will be washed down in whole or in part as necessary. In addition, the building will be equipped with gravity ventilators (louvred roof vents) designed to evacuate building air from the lower level transfer truck loading area through the roof over the tipping floor. In summer months, the gravity ventilators are designed to provide for up to twelve air changes within the building per hour, bringing fresh air into the tipping floor area and moderating building temperatures. Outside of facility hours, all exterior doors will remain closed, further preventing emanation of any odors that may generate within the building due to the staging of waste.

On occasion, due to adverse weather, greater than anticipated peak loads, equipment malfunctions, and other unforeseen circumstances, waste may be staged in the transfer station building for periods not exceeding 72 hours. The occurrences will be minimized to the extent possible by the DSWA by re-routing incoming wastes to other permitted solid waste management facilities and/or temporarily extending daily operating hours. In such cases, waste will be retained in the transfer station building or in the tarped transfer trailers.

Operational and engineering considerations for the control of odor, dust and vehicle emissions inside the building include:

- Roof ventilation to provide positive (upward) flow of air from within the building. The main source of outside air to ventilate the building will be the two truck bay doors at the lower level transfer trailer area below the tipping floor. The passive building ventilation system is designed to provide up to 12 changes of the building air volume per hour.

- Truck bay doors will be powered so that they may be opened and closed rapidly.
- The building is equipped with water hose so that the tipping floor can be wetted to reduce dust.
- As the primary means for odor control, standard operating procedures will be that all wastes are removed from the facility on a daily basis. Waste will not be allowed to remain in the facility for more than 72 hours. When the facility is not operating, all exterior doors will remain closed.

4.2 NOISE

The potential for impact to the surrounding area from noise generated at the transfer station building was taken into consideration in the design of the facility. Areas where concentrated noise generating activities will take place include the commercial truck unload queuing area, the truck maneuvering area (located at the entrance to the tipping floor), and the tipping floor. Noise control features included in the engineering design include the siting and layout of the transfer station, enclosure of the tipping area, and the planting of on-site vegetation. The closest sensitive receptor (Class A Noise Zone) is Indian Mission Church, located approximately 1,700 ft north of the transfer station building. Existing vehicular and truck traffic at the adjacent intersection of Routes 5 and 48 typically dominate ambient noise levels at the Indian Mission Church. The facility does not result in an Intrusive Noise per Chapter 71, Section 7105 of DNREC Regulations Governing the Control of Noise.

The transfer station will be located approximately 1,700 ft from the closest receptor with the entrance to the tipping floor facing south. At this distance, a worst case operational Leq noise levels of 85 dBA (unenclosed outside) would be perceived as 55 dBA Leq at the church and would likely be masked by existing traffic on Routes 5 and 48 (60-70 dBA Leq). This calculation does not include additional attenuation from the partial interference from the transfer

station building itself and the proposed on-site vegetation that would further reduce the off-site noise impact. Noise generated inside the transfer station on the tipping floor would primarily include the operation of a loader and the dumping of material from trucks onto the floor. These noise activities would typically range between 75-90 dBA and would be minimized by the enclosed structure;. Noise impacts from these activities when the tipping area doors are open would still be mitigated by the enclosed structure, while noise directly traveling through the door openings would be projected away from potential receptors.

Periodically, instantaneous noise (i.e., horns, back-up alarms) above 85 dBA may be generated from the site. These noise sources, however, are not expected to exceed the 80 dBA Impulse Peak Limit at the facility property line.

5.0 FACILITY LEACHATE AND WASHDOWN WATER COLLECTION SYSTEM

The facility has been designed to contain the release of leachate and washdown waters (facility wastewater) generated within the transfer station building, including the tipping floor, truck parking and unloading area, and the transfer trailer loading area. A leachate and washdown water collection and disposal system is included in the design of the transfer station. This collection system will be a self-contained system that conveys collected facility wastewater from transfer station operations into an aboveground storage tank. The system is self-contained in the concrete area surrounding the storage tank, and can hold 110% of the tank volume, refer to calculations in Attachment B. Specifications for the collection piping and the storage tank are provided in Attachment A. A permitted hauler under contract to DSWA will manage all collected facility wastewater.

The facility wastewater (non-sanitary) collection system designed to prevent wastewater generated during normal operations (such as wash-out and cleaning of equipment, trucks, and floors) from contaminating the soil, surface water or groundwater.

The facility wastewater collection and disposal system will be approved in advance by the Department and will consist of the following:

- The tipping, loading, and unloading areas will be constructed of reinforced concrete impervious to the passage of facility wastewater anywhere except through the drainpipes and sump/collection system. Any liquids draining from the dumping and loading of trash will be collected by floor drains and directed through double-walled buried piping to a duplex pump-equipped sump. From the sump, the facility wastewater will be pumped to a 5,000-gallon above ground, corrosion resistant storage tank located on a concrete secondary containment pad adjacent to the transfer station building. The concrete secondary containment area is sized to contain 5,850 gallons, which is 117% of the storage capacity of the tank. The secondary containment pad includes a valved sump, which is normally closed. After a rainfall event and after inspection of the water in the sump area, the valve is opened to release the water by gravity into the adjoining stormwater swale. Materials accumulating in the storage tank will be pumped out on a scheduled or an as-needed basis, and transported to a duly permitted treatment facility. The holding tank will be equipped with a level indicating device, as well as a high level alarm. Facility wastewater and other facility and maintenance fluids will be prohibited from being discharged to the facility's on-site sanitary wastewater treatment system (septic system). The septic system will be restricted to domestic sanitary sewage only.

The unloading, tipping, and trailer loading areas are completely enclosed with the facility. To minimize blowing litter, upon exiting the facility, loaded transfer trailers immediately enter the tarping station to be covered prior to moving around the site and exiting the facility and going to the designated disposal facility.

6.0 SITE SECURITY AND SAFETY MEASURES

The facility has been designed with features to provide adequate site security and public safety.

These include:

- Perimeter security fencing to secure site access.
- Restricted area access: the general public is not permitted to enter the facility without appropriate supervision.
- Residential and commercial traffic has been segregated and their respective drop-off/unloading areas are separate.
- The facilities have been designated as non-smoking, in accordance with the State's current Clean Indoor Air Act. Designated smoking areas outside of facility buildings will be established.
- Scavenging will not be permitted at the facility.
- The facility has been designed to minimize the potential for falls by customers.
- Vectors are reduced through the use of site fencing and the proposed construction of the building.

Fencing at the facility is designed for safety, litter control, and aesthetics. Fencing details are provided on Sheet G-11. The types of fencing to be used are described below:

- Type I Fence: Post and rail fence along perimeter of storm water ponds to restrict access.
- Type II Fence: Chain-link security fencing enclosing facility, including scale house and truck scales. Type II fence includes 3-strand barbed wire at top.

- **Type III Fence:** Type II fencing provided internally at the facility without barbed wire. For example, as a safety measure, Type III fencing is provided along the top of the retaining wall where the transfer trucks exit the building.

7.0 EMERGENCIES

The Plan of Operation (Tab 4) includes a description of emergency procedures and includes all emergency contact information. Below is a brief description of proposed measures.

Emergency Response

Emergency response procedures are established in the Plan of Operation. In general, all emergencies are reported to the facility operator and the DSWA. Depending on the type and nature of the emergency, the DSWA will take appropriate action and additional emergency responders may be notified (police, fire, paramedics, etc).

Fire Protection

A fire suppression system will be installed at the transfer station building, which will be approved by the State Fire Marshal. The facility will also have an alarm to a central security system, which will in turn notify "911" and the local fire company.

Emergency Shower/Eye Wash

An emergency shower station as well as other emergency response/First Aid supplies (i.e. portable eye wash equipment) will be maintained in the building.

Spill Kits

Spill kits will be maintained in the transfer station building and will consist of absorbent media or booms.

Backup Lighting

Lighting in work areas (offices, tipping floor) is designed to provide an average maintained illumination level of 50 foot-candles (fc). Lounge areas (lunch room, kitchenette) are designed to have an average level of 30-40 fc, and utility rooms, storage areas, restrooms, hallways and covered parking areas are designed for an average level of 20-30 fc. These meet or exceed recommended IESNA fc levels for such areas. Should a power outage occur, adequate emergency lighting has been incorporated in the building electrical design, and in the scale house. Backup battery units will provide power for emergency lighting. In addition, the backup generator can be used to provide adequate power to provide minimum lighting levels during power outages.

8.0 SCHEDULE

A schedule for construction and start of operations will be submitted upon completion of the permitting process. It is the DSWA's intent to initiate construction of the facility as soon as practicable upon receipt of the required permits. A detailed construction schedule will be provided to DNREC in advance of the start of construction.