

APPENDIX 10.15

ENVIRONMENTAL NOISE STUDY

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FINAL REPORT

ENVIRONMENTAL NOISE STUDY

RESOURCE RECOVERY FACILITY

PALM BEACH COUNTY SOLID WASTE AUTHORITY

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A. INTRODUCTION

An environmental noise study of the proposed Resource Recovery Facility has been undertaken. The purpose of this study has been to identify significant noise-related impacts associated with the development and operation of the proposed facility. In characterizing these noise related situations attention has been paid to identifying adverse noise impacts which may occur and to identifying feasible noise mitigation schemes to address these problems.

The scope of this study addresses the development of the facility, its operation and the closing out of portions of the facility as time progresses into the future. The focus of this work includes noise impact on the surrounding areas including those areas nearby which might be affected by noise emanating from activities on the landfill site itself. Additionally, attention is given to the effect of surface transportation units as they go to and from the facility. This transportation effect comes about from the noise generated from vehicles using the roads in the surrounding areas.

Attention is given to noise levels at on-site locations as well. The operation of the landfill and resource recovery plant involves the use of large equipment capable of generating significant noise levels at operator positions. These factors are considered in the analysis of this subject.

In the development of this report the text material is organized as to noise impacts off the site from on-site sources and transportation sources and as to noise impacts on the site from on-site sources. Each individual section is further organized to include the ambient sound level conditions which could be expected if no noise sources related to the proposed facility were expected.

In order to assess the significance of noise from the proposed landfill facility recommended or required noise level criteria are included. Projected

noise levels for noise-sensitive sites and situations on and around the facility are developed based on predictive models of known accuracy and from field data taken from other similar existing situations. Noise impacts have been ascertained based on a comparison of the noise levels anticipated from the proposed facility and both recommended or required criteria as well as noise levels which existed prior to the proposed facility. Where noise impacts have been identified their severity has been described and, where warranted, noise mitigation alternatives are presented.

The discussion now turns to the elements of the study. Following the order in which they are addressed, the text will discuss the subject of existing noise levels in the project area. Attention will then be given to noise impact in surrounding areas as a result of surface transportation units going to and from the landfill and resource recovery facility. Attention is then paid to the effect of noise radiated from the facility area into surrounding areas. Finally, the subject of noise impact on-site is considered. A summary is included as a final section which includes all findings and recommendations arising from this study.

As a final note, the sound levels used to describe environmental conditions will be described in terms of their amplitude and time character. A-weighted sound levels are employed as is the practice in environmental acoustics. The time-dependent characteristics of the sounds will be described in terms of the maximum sound levels, the equivalent energy levels or LEQ as well as the L10 and L50 levels.

The LEQ is a measure of the average energy over a period of time and is most often cited due to its relatability to community reaction. The L10 and L50 provide estimates of the sound levels which are exceeded 10% and 50% of a measurement period respectively. In traffic noise problems for example, an

<u>Activity Category</u>	<u>Design Noise Levels - Decibel (Hourly)</u>		<u>Description of Activity Category</u>
	<u>L_{eg} (h)</u>	<u>L₁₀ (h)</u>	
A	57	60	Tracts of land in which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such areas could include amphitheatres, particular parks or portions of parks, open spaces, or historic districts which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
B	67	70	Picnic areas, recreation areas, playgrounds, active sports areas, and parks which are not included in category A and residences, motels, hotels, public meeting rooms, schools, churches, libraries, and hospitals.
C	72	75	Developed lands, properties or activities no included in categories A or B above.
D	--	--	
E	52	55	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

TABLE 10.12-1 Recommended sound levels as developed by
Federal Highway Administration (FHWA).

hourly period is employed. Figure 10.12-1 presents a selection of representative situations and their respective sound levels. Tables 10.12-1 and 10.12-2 and 10.12-3 include recommended design criteria for acceptable noise levels in decibels (dB).

In the text of the report, specific references will be made to appropriate recommended or required noise levels requisite for a desired degree of environmental quality. It should also be kept in mind that while impact may be incurred if those criteria levels are exceeded, changes in sound levels, if sufficiently great, may also constitute an impact. Generally a 1 dB to 3 dB change in sound level may not be perceptible. An increase from 3 dB to 5 dB becomes more so and under the appropriate conditions may cause public reaction. A 10 dB increase in the sound level will be clearly noticeable and when caused by a distinct change in the nature of the acoustic environment should be a matter for concern.

TABLE 10.12-2 Recommended Sound Levels as Developed by
Department of Housing and Urban Development

	Twenty-four hour day-night average sound level with 10 dB penalty for period from 10 PM to 7 AM
Acceptable	Not exceeding 65 dB
Normally Unacceptable	Above 65 dB but not exceeding 75 dB
Unacceptable	Above 75 dB

TABLE 10.12-3 Noise Level Limits from Palm Beach County Noise Ordinance for Fixed Mechanical and Other Noise Sources Excluding Vehicles on Public Roads

Maximum Permissible Sound Levels, General Prohibition

No person shall operate or cause to be operated any source of sound from any location in such a manner as to create a sound level which exceeds the limits set forth in Table 1 for inhabited residential receiving land more than ten percent (10%) of any measurement period, which period shall not be less than ten minutes when measured at or within the property boundary of the complaining property. A violation of this Ordinance shall have occurred without the occasion of the measurements being made as provided herein if circumstances are such that the offending sound, because of its very nature, is usually loud and obviously offensive to a reasonable prudent person or ordinary sensitivity situated upon the complaining property.

Sound Level Measurement shall be made with a Type 2 or better sound level meter using the A-Weighting Scale in accordance with the standards promulgated by the American National Standards Institute (ANSI).

Measurement Location: All measurements shall be made with a sound meter at or within the boundary of the complaining property.

TABLE 1

MAXIMUM PERMISSIBLE SOUND LEVELS
FOR INHABITED RESIDENTIAL RECEIVING LAND

<u>Receiving Land</u>	<u>Noise Source</u>	<u>Time</u>	<u>Sound Level Limit</u>
Inhabited Residential Land	Fixed Mechanical Equipment	Any Time	60 dBA
	All Others	7:00 AM - 11:00 PM	60 dBA
		11:00 PM - 7:00 AM	55 dBA

B. EXISTING NOISE LEVELS

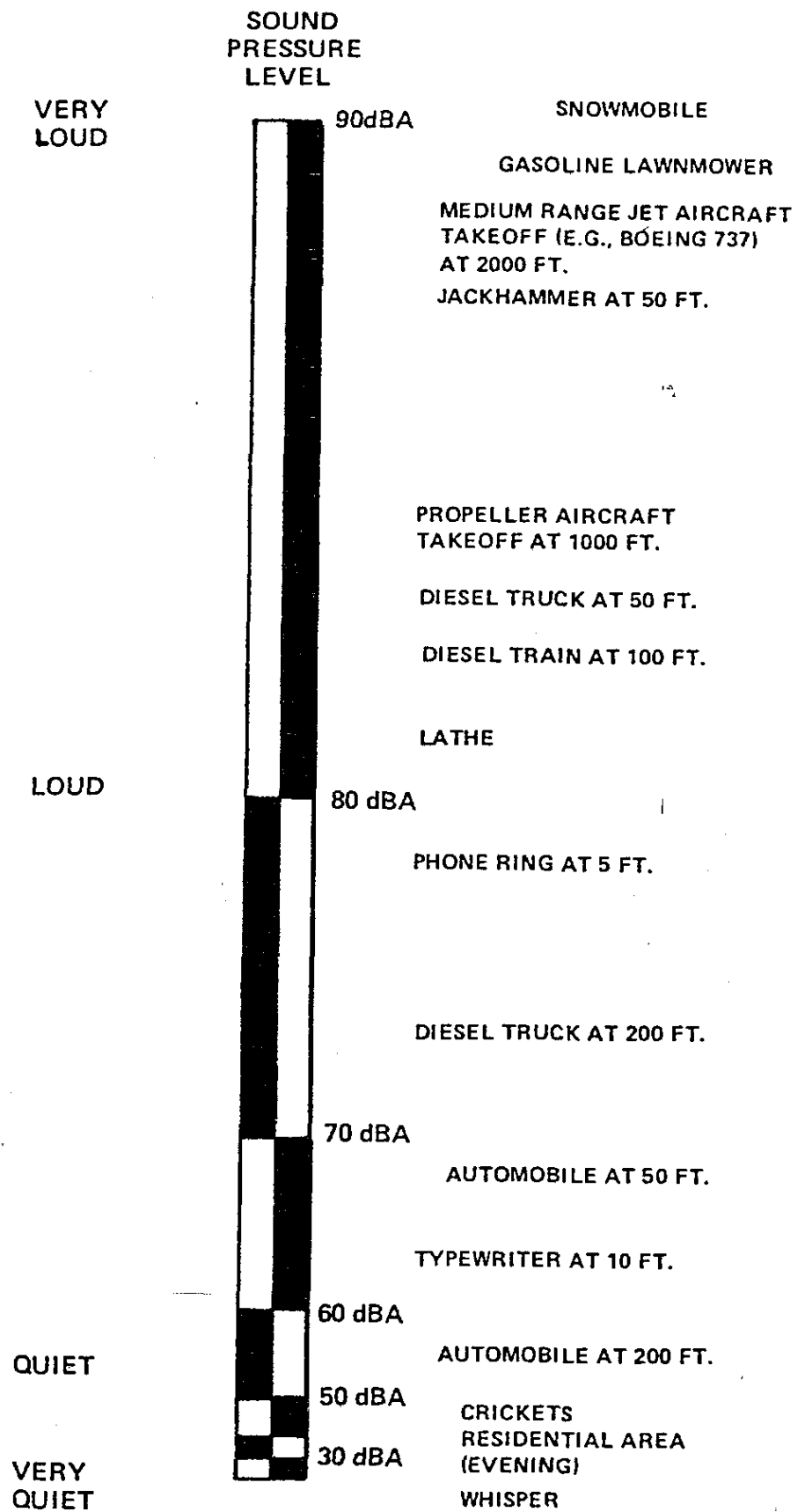
As a beginning to the project it was necessary to survey the area as to land use, identify noise-sensitive areas and to characterize existing noise levels. The areas of the project, together with their respective existing noise levels, are provided in Table 10.12-4.

To summarize, one may orient relative to 45th Street which presently is the street heading to the entrance of the facility. On Haverhill Road, a developed residential area exists at the 45th Street-Haverhill Road intersection on the northwest corner. Further north, residential areas exist and then the character of the area tends to industrial. South on Haverhill from 45th Street, the area contains residential areas from around Roebuck Road to the south. Around the intersection of Haverhill and Okeechobee and south the development is a mixture of commercial and residential.

Well to the north the Bee Line Highway runs from West Palm Beach to the northwest. From the intersection of Bee Line and Haverhill and to the west to the Florida Turnpike a residential area lies to the north of the Bee Line. A substantial setback exists between this development and the Bee Line.

Military Trail is developed commercial north of 45th Street. South of 45th the development is a combination of residential, commercial and great extents of open areas. Okeechobee Boulevard to the south is a major east-west artery and is developed in a commercial fashion. Residential multi-family exists to the north but is set back from the road some distance.

On 45th Street, east of Haverhill Blvd., the development is a mixture of residential and commercial. A stretch of residential development exists on the north side of 45th Street west of Haverhill a portion of the distance to the Florida Turnpike.



FIGURE

**Selected Representative Activities and
Associated Sound Levels.**

Noise levels in these areas were measured during the daytime hours in order to relate to the anticipated hours of operation of the landfill facility. These levels are included in Table 10.12-4. Noise levels were found to be dominated by the traffic which presently exists on Haverhill Road, Okeechobee Boulevard, Military Trail and 45th Street. The distances indicated in Table 10.12-4 are to indicate the distances from the road edge to the point where the measurements were taken.

The industrial and commercial areas along the roads in question here were not the subject of undue noise impact due to existing traffic noise. Residential areas along these roads were similarly within accepted FHWA recommended criteria for highway noise levels although certain houses located closer to the roads than others did receive noticeable traffic noise. Areas such as along Haverhill Road were found to be the subject of traffic noise pollution, however not to an extent which obviously exceeded FHWA or HUD recommended criteria.

The residential area north of the Bee Line receives some traffic noise from the Bee Line and the Florida Turnpike. This effect is felt primarily along the boundary properties of the area. Sound levels measured within this area were within federal guidelines and were lower as one moved into the area.

TABLE 10.12-4 Areas Within the Overall Project Area with
Representative Existing Weekday Sound Levels

<u>AREA</u>	<u>DISTANCE TO MAJOR ROAD</u>	<u>WEEKDAY SOUND LEVEL LEQ (dBA)</u>
45th St., West of Haverhill	100'	54
Haverhill, 45th to Roebuck	100'	62
Haverhill, Roebuck to South of 12th	100'	60
Haverhill, 45th to Port Road (Bee Line)	100'	58
Okeechobee, Turnpike to Haverhill	100'	65
45th, Military Trail to Haverhill	100'	58
45th, I-95 to Military Trail	100'	63
Military Trail, Roebuck to Port Road (Bee Line)	100'	60
North of Port Road and East of Turnpike	150'	55

C. NOISE IMPACT ON SURROUNDING AREAS DUE TO TRANSPORTATION UNITS MOVING TO AND FROM THE PROPOSED FACILITY

The development and operation of the proposed Resource Recovery Facility will include the delivery of material to the facility, as well as the departure of these vehicles empty of material from the facility. These activities will be accomplished in large part through the use of a variety of trucks which will access the facility through its main entrance, the portion on N.W. 45th Street west of the Florida Turnpike. These vehicles in turn will move to and from N.W. 45th Street on a variety of roads. It is the purpose of this section to describe the analysis and findings of a study to determine the impact of the facility-related traffic on the areas through which it will pass.

Traffic flow patterns related to the proposed facility have been developed by the firm of Kimley-Horn and Associates. Based on their analysis which is presented in detail in another part of the complete report on the facility, traffic due to the facility is anticipated to occur on the surrounding roads including Haverhill Road, north and south of 45th Street, on Military Trail, north and south of 45th Street, on 45th Street and on Okeechobee Boulevard between Haverhill Road and the Florida Turnpike.

The traffic data developed by Kimley-Horn was employed in the FHWA Traffic Noise Prediction Model to predict traffic generated noise levels generated by the facility-related traffic over and above the existing levels. A growth in traffic on all the roads in question is expected to occur over existing traffic due to the growth of the area irregardless of the development of the facility. Thus the comparison of facility related noise impact to existing noise levels will be the more dramatic comparison.

With regard to the significance of these traffic levels, the Kimley-Horn traffic assessment indicates that the additional traffic related to the facility

on Military Trail and on Haverhill Road north of 45th Street has an "Insignificant Effect" on the level of traffic expected. These traffic levels would similarly have an insignificant impact on the noise from these roads.

Sound levels in these cases in terms of LEQ and L10 would be increased by less than 1 dB over those which presently exist. This increase would not be discernible in the residential areas along Haverhill Road to the north of 45th Street. Further north along 45th Street the area becomes industrial and is not considered a noise-sensitive area. Further, the sound levels in this area are within acceptable limits insofar as recommended noise levels are concerned, thus no significant impact is expected. These traffic noise levels together with their associated noise impacts ratings are summarized in Table 10.12-5.

The Kimley-Horn studies project somewhat greater levels of facility-related traffic on Okeechobee Boulevard, Haverhill Road south of Okeechobee Boulevard, Haverhill Road between N.W. 12th Street and N.W. 45th Street and 45th Street between Military Trail and Haverhill Road. These facility-related traffic increases are rates as being "Insignificant Impact" by Kimley-Horn from a traffic point of view. Noise impacts from the traffic on Haverhill Road south of Roebuck Road, on Okeechobee Boulevard, and on 45th Street between I-95 and Military Trail can be expected to have little additional impact on the contiguous areas. Noise levels in terms of LEQ or L10 values should increase on the order of 1.5 dB over existing levels. This level of increase is not expected to be perceptible. Hence no significant impact is expected in these areas. Again, these situations are summarized in Table 10.12-5.

The area along Haverhill Road between Roebuck Road and 45th is projected to carry the same number of project-related vehicles as the remainder of Haverhill south to Okeechobee. Because existing traffic levels are somewhat lower, a lightly greater increase in noise level is expected. However, the increase

TABLE 10.12-5 Project Study Areas with Existing and Projected Exterior
Sound Levels and Assessed Impact for Weekday Periods

<u>AREA</u>	<u>EXISTING SOUND LEVEL LEQ (dBA)</u>	<u>PROJECTED SOUND LEVEL LEQ (dBA)</u>	<u>SOUND LEVEL CHANGE/IMPACT</u>
Residential, 45 St. West of Haverhill	54	62	8 dB/Moderate to Significant Impact
Haverhill, 45th to Roebuck	62	64	2.5 dB/Slight Impact
Haverhill, Roebuck to 12th	60	62	1.5 dB/No Impact
Haverhill, 12th South	60	62	1.5 dB/No Impact
Okeechobee, Turnpike to Haverhill	65	66	1 dB/No Impact
45th, Military Trail to Haverhill	58	62	4 dB/Slight Impact
45th, I-95 to Military Trail	63	65	1.5 dB/No Impact
North of Port Road East of Turnpike	55	56	1 dB/No Impact
Military Trail, Port Road (Bee Line) to Roebuck	60	61	1 dB/No Impact
Haverhill, Port Road (Bee Line) to 45th	58	59	1 dB/No Impact

itself should present a minor impact. This taken with the fact that sound levels are within recommended criteria for these areas and will be expected to remain so at noise-sensitive sites, indicates that no significant impact is anticipated along this part of Haverhill.

With regard to the length of 45th Street between I-95 and Haverhill, the stretch from I-95 to Military Trail is expected to experience a small sound level increase which should be difficult to notice over existing conditions. Thus the project presents no significant impact on the area along 45th Street.

For the length of 45th between Military Trail and Haverhill an increase of some 4 dB may be anticipated. This is characterized as a moderate increase in sound level. This area is mainly commercial with a small number of existing residences set well back from the road. Because projected levels at these sites are within recommended criteria no significant impact is projected in this area.

The portion of 45th Street west from Haverhill to the landfill entrance will act to convey all of the vehicles associated with the facility. Because very little traffic presently uses this road an increase in sound levels of some 8 dB is anticipated along this road. This increase in level is significant and is expected to be noticeable as existing sound levels in the residential development along 45th Street are within criteria and are subject only to existing traffic on Haverhill Road. However, even with the increase caused by the landfill vehicles the levels will continue to remain with recommended ranges of Tables 10.12-1 and 10.12-2 but rather toward the higher end. Thus the residential area along 45th Street west from the intersection of Haverhill Road will experience a moderate to significant noise impact because of the increase over existing levels. This can also be said of the residences in the immediate vicinity of the Haverhill and 45th Street intersection.

The single family homes located along 45th Street are set back some 100 feet from the road due to a service road which lie between 45th Street and the houses. This helps to mitigate the effect of the anticipated noise on these homes. The houses along Haverhill just to the north of the intersection of 45th Street adjoin the Haverhill right-of-way and especially at the corner of 45th and Haverhill are close to the traffic noise sources.

The noise from the road will impact both front and rear areas of homes. Additionally, homes with open windows would be subject to increased levels of interior noise as well. This impact would be most significant along the nearest two rows of homes.

While recommended noise level criteria should not be exceeded some consideration as to how to mitigate the traffic noise is warranted. A noise wall between 45th Street and the residences is one alternative which could be used to some effect to reduce the noise from vehicles on 45th Street. Such a wall would be on the order of twelve feet in height or more and run at least the distance of the residential area along 45th Street. A detailed examination of the problem would be required and some consideration to wrapping the wall around at the east and west ends of the residential area would be advised.

Additionally, the landfill facility management could adopt a policy of not admitting any vehicles to the site of its engine exhaust system were in an improper state of repair, was unusually noisy or the engine and mechanical enclosures were in an improper state of repair. Such a policy, if adopted, would eliminate the unusually noisy vehicles from using 45th Street and thus reduce the impact on the residential neighborhood. Also, signs could be posted along 45th Street and Haverhill Road on all four sides of the intersection to caution truck drivers to operate their vehicles with a minimum amount of noise, consistent with safety.

Another alternative to reduce the noise impact on these residences would be to move the traffic route to the south of the current 45th Street right-of-way. This could be accomplished by using undeveloped land to the south of 45th Street in which to locate an east-west access road to join to the present 45th Street near to the Turnpike overpass. Such a road would be placed at least 500 feet to the south in order to offset the effect of the traffic increase past the houses.

Additionally, the effect of the intersection could be offset by developing another route from 45th Street between Haverhill Road and Military Trail to the new access road. This could be accomplished by using the Florida Power & Light Company transmission right-of-way which cuts from 45th Street to the southwest through Haverhill Road. Truck traffic coming west on 45th could divert along this new road to a new intersection on Haverhill with the new site access road. Thus truck traffic associated with the facility could avoid the residential area at the corner of 45th and Haverhill and thus eliminate that noise impact.

In summary, over the majority of the roads affected by traffic related to the facility, little noise impact is anticipated. In the residential area at the corner of 45th and Haverhill Road, significant noise impact is expected especially for those houses along 45th Street. This can be mitigated or eliminated through several alternatives, the most effective of which is to develop a new access road and intersection at least 500 feet to the south of the existing 45th Street right-of-way. The alternative to establish a new access right-of-way uses distance to mitigate the expected noise impact. This approach is clearly the most reliable one of the several offered before and is recommended as such from a noise control point of view.

As a final note, the effect of resource recovery related vehicular traffic noise will, to a certain extent, be made less distinct due to the present of a

traffic growth which will come about due to other demands. This is true, in varying degrees, over the entire extent of the project.

D. ON-SITE NOISE SOURCE ASSESSMENT

As part of the noise study of the proposed Resource Recovery Facility, a noise survey was done to estimate the on-site noise levels. The activity on-site can be divided into two parts; the refuse processing plant, which is stationary, and the landfilling activity which involves non-stationary equipment. To determine the projected noise levels both inside the refuse processing plant and outside, noise measurements were done at a similar facility. With regard to the noise from the non-stationary equipment measurements were done at the existing Haverhill landfill facility.

In general, based on noise levels as measured at an existing similar facility, the predicted sound levels can be expected to vary between 70 to 95 dBA (Table 10.12-6). In the areas where the noise levels are close to 90 dBA or higher no personnel are to be present in these areas without hearing protection. The controls of noisy equipment will be inside enclosed rooms which thus insulate the operator from the surrounding noise. A discussion of the noise levels in the different sections follow.

Tipping Areas: The noise levels at two tipping areas at the studied facility were measured. One of the tipping areas, handling non-household waste, was situated outside while the other tipping area for household garbage was situated within an enclosed building. Because of the different nature of the surroundings and the variety of operations in both tipping areas, the noise levels created where the dozer or trucks are in operation is different.

The measured noise level at the inside tipping area with the overhead crane and trommel in operation is approximately 75 dBA. The noise level increases when either the bulldozer is in operation or a truck unloads. With the dozer in

operation, at full load, the internal ambient level increases to 90 dBA. With only a truck unloading the internal ambient noise level is approximately 83 dBA. Since this area is enclosed with the walls acoustically hard the generated sound field is highly reverberant.

For the outside tip facility, the measured external ambient level with the shredder and lifting crane in operation is approximately 78 dBA. The noise from the dozer, operating at full load, at a distance of ten feet is approximately 94 dBA.

With regard to the operation of any outside shredder facility activities, the level of noise outside the control room will range from some 75 dBA to 95 dBA. Personnel hearing protectors can be employed for the higher level exposure areas as employees are not permanently located there. The recommended noise level in the control room should be about 60 dBA. This level is suggested so that the operator inside the control room will be able to maintain the necessary concentration to avoid explosive cylinders entering into the shredder.

Magnetic Separator and Rotary Trommel: Sound level values will vary in this area ranging from 70 dBA to 85 dBA depending on the proximity to particular pieces of equipment.

Turbo Generator Area: The noise level in the turbo generator building, as measured at the studied facility, is some 75 dBA. The building has acoustically hard walls and the measured noise field was highly reverberant. The noise levels were constant everywhere in the area. There are usually no working personnel in this area and the noise at the studied facility was contained within the building.

Boiler House: Inside the boiler house the measured noise level is some 90 dBA. Most of the generated noise within this area is due to the high velocity, secondary air supply which is used for the even distribution of the fuel inside

the furnace. The noise level in the boiler house as measured is mainly reverberant and thus independent of location.

As for the turbo generator area, no personnel are expected to be permanently near the boilers. All the controls will be inside a control room which is shielded from the boiler noise. It would be recommended that the noise level of the control room be about 55 dBA. The noise from the boilers is well contained inside the boiler house and it would be expected that it will not contribute significantly to the ambient noise level of the area.

Other Outside Equipment: Typical noise levels from other outside equipment were also obtained from measurements done at the studied example plant. The noise levels generated both by large cooling tower and by large fans were measured. The noise from the fans is some 70 dBA at a distance of 50 feet from the fan. The level was highly influenced by the background noise from most of the other equipment on site. The noise level from the cooling towers at a distance of 100 feet from the foot of the tower was also about 75 dBA. Thus it will be expected that the noise level at distances greater than 300 feet from the facility will not be impacted by the outside equipment of the plant.

The measured levels at the studied facility will be the predicted noise levels that will be radiated from the fixed on-site equipment at the new Palm Beach County facility. Although the ambient noise levels varied from 75 to 95 dBA the general ambient noise level outside of the plant was about 75 dBA. This ambient level was the prevailing level within the plant perimeter. That is, this will not be the noise level away from the facility site. The level that must be considered to determine the impact of the new facility on the existing environment will depend on the distance between the considered location and the facility site.

Noise from Moving Equipment: The predicted noise levels from the moving equipment are based on measurements taken at the existing Haverhill facility. Included in the measurements are the noise levels of typical trucks after they leave the weighing platform.

At the existing Haverhill facility, the following equipment is presently being used: Bulldozers to spread and cover the waste; compactors; and pans to transport the dirt for covering. The maximum noise levels measured at indicated distance for the different equipment are listed in Table 10.12-7. The noise levels that were measured vary between 85 to 93 dBA at the indicated distances. The measurements were done when the equipment was operating at full load, and the high level of noise was not continuous.

With regard to the noise levels present near the weighting scales, due to the accelerating trucks, the levels were in the region of 70 to 83 dBA at a distance of 15 feet from the middle of the road.

The general ambient noise level present to this landfill facility from the moving equipment did not exceed 70 dBA. This is comparable to the level measured from the facility.

Assessment of Impact Off-Site

Both from the stationary and non-stationary equipment the ambient noise level on-site does not exceed 75 dBA. Thus the predicted ambient noise level for the proposed Resource Recovery Facility is not expected to exceed this noise level.

Taking into consideration the nature of sound propagation from the facility site, areas at distances of greater than some 300 feet from the facility are expected to experience insignificant changes in their ambient noise levels. Noise levels from the facility would then be reduced to levels in the range of some 50 dBA or less. These sound levels would be comparable to or less than pre-

TABLE 10.12-6 Facility Noise Levels

<u>LOCATION</u>		<u>NOISE LEVEL</u>
Trash Shredder:	ambient	78 dBA
	with bulldozer	
	in operation	94 dBA at 10 feet
	control room	65 dBA
	side of shredder	76 dBA
Garbage Tipping Area:	ambient	74 dBA*
	truck unloading	83 dBA*
	bulldozer	90 dBA*
Turbo-Generator:		74 dBA*
I.D. Fan:		73 dBA at 50 feet
Cooling Tower:		74 dBA at 100 feet
Boiler House:		89 dBA (max)*
Separators:		86 dBA 6 feet from conveyor

Noise impact will depend on exposure time.

* REVERBERANT FIELD

TABLE 10.12-7 Landfill Non-Stationary Equipment

<u>EQUIPMENT</u>	<u>NOISE LEVEL</u>
Pan	85 dBA at 20 feet 90 dBA at 10 feet
Caterpillar	93 dBA at 10 feet 94 dBA at 3 feet
Bulldozer	84 dBA at 50 feet
Compactor	86 dBA at 5 feet
Dredge	98 dBA at 3 feet 94 dBA at 5 feet
General Ambient	60 - 70 dBA
Trucks	63 - 82 dBA

Noise impact would depend on exposure time.

sently existing traffic noise levels in areas in the vicinity of the proposed site.

The Grier ranch and houses are also at distances of greater than 300 feet from the facility. The buildings in this area are situated about 600 feet from the property line. Thus the distance between the facility site and any of these buildings is large enough so that no adverse noise impact will be created.

Therefore, it can be concluded that nowhere in the vicinity, except areas on-site, will high noise levels exist. The impact of the new facility on the surroundings is insignificant and, in places, non-existent.

Proposed Noise Control Measures On-Site

Although the facility will not have an adverse impact on the surrounding areas it is recommended that some landscaping be done around the perimeter of the facility. Trees and earthen berms can be used around the perimeter to screen the facility from direct visual sight. Also, the use of earthen berms could contribute to the noise reduction since these will act as noise barriers. This is not acoustically necessary, but will make the facility more acceptable and less noticable.

With regard to on-site equipment, a number of measures are recommended to reduce the predicted noise levels. It is commonly recommended that the noise exposure for an eight-hour working day does not exceed 90 dBA. Although such a high level is not predicted to be existent in manned areas at the Dyer Boulevard facility it is recommended that when maintenance work is scheduled for areas with a noise level greater than 85 dBA, earmuffs are provided. Noisy areas include the boiler house, the turbo generator plant and near the shredder machinery. The control room near the outside shredder and the control room near the boiler should have a sound reduction of some 35 dB.

The noise in the turbo generator plant room is mostly reverberant and it is recommended that acoustically absorbing blocks be considered in the construction of this plant building. Sound absorbing blocks will not create a fire hazard. By the use of such sound absorbing blocks the level in this area of the facility will be reduced and this will result in a reduction of the ambient noise level.

For the enclosed tipping area, no personnel should be allowed to work in this area without wearing earmuffs. Equipment operators should either have an enclosed cab or alternatively supplied with ear protectors.

The noise level generated by all the moving equipment both for that used near the plant and that on the landfill, as predicted, may be more than the recommended level especially at the operator position. Thus it is recommended that all moving equipment will be of the enclosed cab type or the operator supplied with adequate ear protectors. For this purpose the earmuffs must have a high noise reduction because the levels will exceed 90 dBA at full load. An industrial noise control and hearing protection program for the facility would serve to manage the overall aspects of the noise control effort on site.

E. SUMMARY

As part of the environmental study of the proposed Resource Recovery Facility, an acoustic study was undertaken to identify significant noise-related impacts associated with the proposed project.

The acoustical study addressed three different areas:

1. The presently existing traffic-related noise levels on roads close to the proposed site.
2. The prediction of increased noise levels due to the increased volume of traffic going to and from the proposed facility, and
3. The noise impact both on-site and off-site from both on-site stationary sources and transportation sources operating on the site.

The presently existing traffic noise levels were obtained from field measurement and the results compared to depicted levels using the FHWA recommended model to insure accuracy. This predictive model was used to estimate the levels that would be associated with the increased volume of traffic due to the proposed facility.

Together with the measurement of the existing noise levels, the surrounding area for the proposed facility was surveyed to identify land use and any particular sensitive residential areas. Measurement locations were considered at some twelve different noise-sensitive sites around the proposed facility and along roads which would carry traffic to the facility. Noise level comparisons are based on amplitude values using A-weighted decibel levels as is the practice in environmental noise studies.

Measured presently existing traffic noise levels are within accepted FHWA and HUD recommended criteria. The predicted future noise levels are based on projected traffic data as supplied by Kimley-Horn and Associates, Inc. The predicted level of noise, in all of the residential areas around the proposed facility, due to the increased traffic volume, did not exceed FHWA or HUD recommended noise level criteria. However, along two sections of roads, on 45th Street; west of Haverhill Road and between Military Trail and Haverhill, an increase in noise level of approximately 8 dB (west of Haverhill) and 4 dB (Military Trail-Haverhill) respectively, is expected over existing conditions. 45th Street west of Haverhill will convey all the traffic into the proposed facility, while at present only local traffic makes use of this road. In this case, mitigation alternatives which include either a noise wall or relocation of the facility access road to the south, have been recommended so as to alleviate the impact. With regard to the section of 45th Street, between Military Trail and Haverhill Road, this section is mainly commercial and all residential

property is well set back so the resulting impact is slight. The increase in level at all other roads is less than 2dB, making the impact insignificant at those areas.

With regard to noise impact off-site from on-site sources, general ambient on-site noise levels were estimated by comparison to existing similar facilities through actual noise measurements. The general on-site ambient level at this facility is expected to be some 75 dBA (max). Locations at distances greater than 300 feet from the areas of activity in the facility will not suffer significant increases in noise levels due to on-site activities. Thus, there is no significant noise impact expected off-site from the on-site equipment.

With regard to the noise impact on-site from on-site equipment, while for the most part serious noise problems are not expected, there are areas where the level of noise exceeds recommended OSHA levels. However, in general, high noise level areas are localized or enclosed and no personnel work within the area for extended times. Where personnel are present, alternative mitigation procedures, including personal hearing protection, are possible to reduce personnel exposure to noise to within recommended levels and criteria. Noise control of heavy equipment for the operators will be available using enclosed operator cabs and current noise control accessories.

In summary, no fatal flaw has been identified with regard to environmental noise resulting from the proposed Resource Recovery Facility for Palm Beach County. For the most part, environmental noise impact is slight and for those situations where an impact is anticipated, reasonable noise control alternatives have been identified and recommended.