Final Determination of the Administrator Concerning North Miami Landfill Site Pursuant to Section 404(c) of the Clean Water Act

I. Introduction

Under section 404(c) of the Clean Water Act, the Administrator of the Environmental Protection Agency (EPA) is authorized to prohibit the specification (including the withdrawal of specification) of any defined area as a disposal site, and he is authorized to deny or restrict the use of any defined area for specification (including the withdrawal of specification) as a disposal site, whenever he determines, after notice and opportunity for public hearings, that the discharge of such materials into such area will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas. Before making such a determination, the Administrator shall consult with the Chief of Engineers, the landowner, and the applicant, if any.

After consideration of the record in this case, including public comments and the hearing record and comments from the Office of the Chief of Engineers, and after consultations*/ with a duly authorized representative of the City of North Miami, I have determined that the discharge of certain dredged and fill materials into the North Miami landfill will have an unacceptable adverse effect on shellfish and fishery areas, wildlife, and recreational areas. Therefore, I am hereby exercising my authority

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*/ At my request, the Director of EPA's Office of Environmental Review acted as my representative at this meeting.

to restrict the use of the area in question for specification (including the withdrawal of specification) as a disposal site, as described more fully below. My findings and reasons are also set out below.

II. Background and History

On March 15, 1976, the Jacksonville District Corps of Engineers (COE), issued a joint Section 404/Section 10 permit (75B-0869) to the City of North Miami to fill 291 acres for a public recreational facility consisting of two golf courses, tennis courts, and a clubhouse adjacent to Biscayne Bay. Approximately 1,540,000 cubic yards of fill material were to be used to achieve sufficient elevation for landscaping the golf courses and to prevent damage caused by flood tides. Only 103 acres of the area to be filled were wetlands, and there were to be 8.2 acres of mangroves preserved and 3 shallow ponds with tidal connections created within the overall fill area. A large area of mangroves also exists between the fill site and Biscayne Bay. Neither the COE public notice nor the COE permit referenced the use of solid waste (garbage) as the fill material. EPA Region IV did not oppose the project.

On March 25, 1977, the COE advertised permit application 77B-0376 which was a modification of permit 75B-0869. The proposed permit modifications involve excavating the three tidal ponds to minus 35 feet mean sea level (MSL) for borrow material instead of to minus 3 feet as originally proposed. The 8.2 acre mangrove

preserve to have been contained within the golf course area under permit 75B-0869 would also be converted into a borrow area. Public notice 77B-0376 also provided notification to the public that the 291 acre project area would be operated as a sanitary landfill, utilizing solid waste (garbage) as fill material (i.e., several more million cubic yards of solid waste would be deposited in waters of the United States).

Since issuance of COE Public Notice 77B-0376, EPA has maintained its opposition to the use of wetlands at this site for solid waste disposal. Because the Region was unable to resolve differences of opinion with the Jacksonville District and South Atlantic Division Engineers, the application was elevated to the Deputy Administrator of EPA and the Assistant Secretary of the Army (Civil Works) under Section 404(q) of the Clean Water Act. (During this process, the discharge of garbage was halted on an interim basis.) When these discussions failed to resolve the matter, the EPA Regional Administrator for Region IV, Rebecca Hanmer, initiated action under Section 404(c) of the Clean Water Act. Following due public notices, she held a public hearing on the matter in the City of North Miami Beach, Florida, on October 2, 1980. Subsequently on November 28, 1980, she forwarded her recommended determination and the administrative record for my review and final determination in accordance with the 404(c) regulations (40 CFR §321).

Ms. Hanmer's recommended determination would have restricted the use for specification of the area covered by permit 75B-0869 as a disposal site and thereby prohibited any further permanent discharges of fill material into the area except as specified in the determination. Her recommendation included several mitigative measures. She also recommended the outright denial of the use for specification of the 12 acres at issue in proposed permit 77B-0376, part of the same site covered by COE permit 75B-0869. Her determination was based upon existing and anticipated water quality impacts that pose the risk of unacceptable adverse effects to fishery areas, wildlife and recreation areas of Biscayne Bay, adjacent wetlands and lakes within the site.

On December 2, 1980 and December 3, 1980, respectively, my office received the administrative record and Ms. Hanmer's recommended determination. After these materials were reviewed, I sent letters to the Chief of Engineers, Lieutenant General Joseph K. Bratton, and the Mayor of the City of North Miami, Mr. Howard Neu, on December 29, 1980, initiating consultation in accordance with the 404(c) regulations. They then had 15 calendar days to notify me of any intent to take corrective action that would prevent, to my satisfaction, any unacceptable adverse effects. My staff met with Mayor Neu on January 12, 1981, as part of the consultation. The Chief of Engineers, acting through his Director of Civil Works, submitted comments in writing on the same day. I subsequently reviewed the information they submitted, along with the record, and determined that I should restrict the site for use as a disposal site as described below in this final determination.

III. Unacceptable Adverse Effects

A. Generation of Leachate

At present, approximately 60 acres of the wetland and most of the upland have been filled with solid waste. There is only a 6" cover of clean fill on approximately half of this solid waste. Several lakes have been excavated through the solid waste and into the aquifer to depths up to minus 35 feet MSL. The record indicates that placement of solid waste on the site has resulted and will result in significant leaching into these lakes, the adjacent wetlands, the water table which connects with Biscayne Bay, and ultimately the Bay itself.

Personnel from the Dade County Department of Environmental Resources Management (DERM) inspected the northwest lake on January 15, 1980, and observed five leachate streams entering the lake. DERM personnel returned to the site on January 17, 1980, and took water quality samples. They found that the leachate entering the northwest lake had an ammonia concentration in excess of 500 ppm, which is evidence of gross contamination. Additional data collected on February 22, 1980, by Post, Buckley, Schuh and Jerrigan, Inc., a consulting firm employed by the applicant, show that three lakes on the site had surface water with ammonia concentrations ranging from 5-20 ppm. Subsequently, EPA and DERM took additional samples of these lakes and independently verified the high levels of ammonia.

EPA has also found thirty-one man-made organic compounds in one leachate sample associated with one of the lakes. Twenty of these compounds were identified as belonging to various families of chemicals often asociated with household wastes such as solvents, plasticizers, and lubricating fluids. Some other compounds can be linked to pharmaceutical wastes. Five of the organic compounds identified were priority pollutants which are known or strongly suspected of having toxic effects on man and other animals. These compounds have so far been found at low concentrations. However, given the sporadic and unpredictable nature of the distribution of chemicals in solid waste landfills, there is no assurance that concentrations will remain at this low level, particularly if dumping resumes.

The leachate problem is not confined to the lakes. Data collected by DERM on several occasions shows that the surface waters of the mangrove preserve just east of the solid waste disposal site (e.g., just outside the existing dike) have ammonia levels much higher than those in samples taken from Biscayne Bay or from surface waters of a mangrove community located away from the site at issue. Independent sampling and analysis by EPA scientists have further confirmed that concentrations of total ammonia as high as 9 ppm are now present in the mangrove preserve. This indicates that the shallow groundwater is contaminated east of the landfill and will be a continuing conduit for ammonia generated by the garbage. It also indicates that the dike does not prevent the passage of leachate.

Leachate has not yet been detected in the Bay itself. However, leachate from an adjacent site can take many years to travel to a water body, depending upon site conditions, precipitation and man's interference. In the present case, measurements of leachate in the lakes and wetland areas have shown increasing levels over time. For example, as of 1977, EPA had not been able to detect any leachate, whereas 1980 samples showed levels as high as 500 ppm in particular streams (see p.. 5, supra). EPA models, developed to predict the production of organic acid leachate from solid waste disposal facilities, predict that the waste already disposed of at this site will produce large quantities of leachate for many years. Therefore, it is probable that the leachate will ultimately reach the bay itself. The continued discharge of garbage will obviously serve to exacerbate this situation.

While the applicant's consultant, Post, Buckley, Schuh and Jernigan, Inc. (PBS&J), concluded that the organic substrate at the site would serve as an attentuation barrier between the landfill and Biscayne Bay, I am not persuaded that it will prevent unacceptable adverse effects in the Bay. Other evidence supported the extreme transmissivity of the Miami oolite layer. Also, observations of others that leachate has moved from the actual landfill area to the mangrove preserve outside the dike indicates that in fact there is not a sufficiently effective attentuation mechanism present, whatever laboratory tests of soil layers might suggest in theory. Also, other experts commented that PBS&J's methods of sample handling and errors in calculation invalidated its conclusions.) The excavation of deep lakes clearly undercuts the attenuation potenital

of the upper, relatively impervious soil layers. Therefore, based on the record, I conclude that leachate generated by garbage at the site will continue to be produced, that it is likely to reach the bay, and that the placement of additional garbage will increase its concentration and the duration of its production.

B. Toxicity

The record establishes that the observed levels of ammonia are significant. Dr. Joan A. Browder, National Marine Fisheries Service, testified at the public hearing about the toxicity of ammonia to freshwater and saltwater fishes and invertebrates. Ammonia, which is acutely toxic to various aquatic species at low concentrations, is found in the aquatic environment in two forms, ionized ($NH+_4$) and un-ionized (NH_3). While the un-ionized form is generally responsible for ammonia toxicity to aquatic organisms, there is considerable evidence that $NH+_4$ also contributes significantly to the detrimental effects of ammonia on aquatic organisms in some environments. Both forms are present at this site.

Concentrations of 2-20 ppm total ammonia, as found in the lakes, result in concentrations of un-ionized ammonia that exceed EPA's water quality criteria. In fact, in one experiment cited in EPA's Quality Critieria for Water, total ammonia concentrations of 8 ppm produced 50% mortality in the test animals within 24 hours. As discussed above, we can expect the continued generation of leachate at this site for some time from the garbage already on the site. It is logical to expect that the addition of new garbage at the site will result in increased concentrations of ammonia for even longer periods of time.

The record also indicates that low concentrations of oxygen (which are commonly found in surface waters of mangrove swamps such as those present here and in stressed estuaries) can greatly increase the susceptability of aquatic species to ammonia toxicity. In addition, the breakdown of ammonia into nitrites and then into nitrates may result in eutrophication, since estuaries are known to be nitrogen limited. Eutrophication is, of course, a classic sign of poor water quality.

The Corps of Engineers questioned the harmfulness of ammonia in light of my recent decision not to add ammonia to the list of toxic pollutants under §307 of the Clean Water Act. The Corps has misinterpreted the cited Federal Register notice. EPA did not find that ammonia is "not detrimental to warm water fish" but rather that it "is not normally present in ambient waters at concentrations toxic to warmwater fish species." (emphasis added.) Also, the notice expressly states that the full sentence which the Corps quotes is merely a summary of some of the comments received by EPA, that the Agency does not necessarily agree with it, and that it is not to be considered an Agency position.*/

The evidence in this case shows that the ammonia levels at this site are and are likely to continue to be far higher than those normally found in ambient water, and that the levels at

*/ A conclusion not to list a pollutant as a toxic pollutant under §307 does not necessarily mean that the substance does not have toxic properties, or that it cannot cause unacceptable adverse effects, but only that its properties or source do not make it necessary to impose those additional regulatory requirements applicable to the toxic pollutants category. Ammonia, for example, comes largely from POTW's and agricultural runoff, which would be unaffected by its listing.

the site are likely to have adverse effects on the area, especially the wetlands, as fish and wildlife habitat. Furthermore, although ammonia is generally non-persistent, the supply will be steadily replenished here if garbage dumping continues. (If this were a single, one-time release of ammonia, non-persistence would be more significant.)

C. Resources at Risk

North Biscayne Bay is an important recreational fishing area. It also supports commercial fisheries for bait shrimp and bait fish. Portions of the Bay, including the mangrove wetlands, serve as essential nursery grounds for marine fish and invertebrates which play an important role in the food web which supports such fisheries. The Bay and its mangroves also serve as a major feeding area for numerous colonial nesting birds and other wildlife. The wetlands on the site are used for recreational bird watching. Many of these species depend for food upon the small fish and crustaceans found in the Bay and its mangroves. Two endangered species (the Eastern brown pelican and the West Indian manatee) both use this area of Biscayne Bay for feeding purposes. The pelican feeds primarily on menhaden, a forage fish dependent upon intertidal mangrove habitat in its early life stages. The manatee feeds almost exclusively on seagrasses found in Biscayne Bay which could be adversely affected if the Bay's water quality is degraded. These resources of the Bay will be adversely affected by leachate contamination of the mangrove wetlands on the site as well as by contamination of the Bay itself. Finally, the lakes were designed as part of a recreational complex. Their contamination will adversely affect recreation.

In sum, I conclude, based on the total evidence of present conditions and the predictions of future development and movement of leachate, that the use of the North Miami landfill site for the placment of garbage will have unacceptable adverse effects on shellfish and fisheries areas, wildlife, and recreational areas.

IV. Restrictions on Use of the Miami Landfill Area for Specification As a Disposal Site

A. Legal authority

Section 404(c) authorizes several degrees of limitation on discharge of dredged or fill material at a disposal site. Where the facts warrant it, I may prohibit all future discharges of all dredged or fill material at a site, whether or not the site has previously been specified in a 404 permit. If there is already a permit, my action would be a "withdrawal of specification;" if no permit has been issued, my action would be a "prohibition of specification." On the other hand, where some materials will have significantly less damaging effects than others, or where limiting discharges to particular places or to a particular manner will lessen the likelihood of unacceptable adverse effects, I may simply "restrict", or condition, the use of the site for specification. Where an area has previously been specified in a 404 permit, I may further restrict the use of the area by imposing additional conditions on discharge to prevent unacceptable adverse effects from use of the site, that is, by "withdrawing a use for specification."

Of course, an action withdrawing specification or withdrawing a use for specification does not retroactively render unlawful prior discharges in compliance with a validly issued section 404 permit. Conversely, my decision not to prohibit certain discharges would not legitimize any discharge which occurred previously without (or in violation of) a permit. Similarly, any future discharges at the site which are not hereby prohibited must still fall within the terms of a valid section 404 permit issued by the Corps before they may take place.

In the present situation, after consideration of the record and the Corps' submission and consultation with the Mayor, who represents the landowner and the applicant, I have concluded that the imposition of restrictions would be more appropriate than a total prohibition against discharges.

B. Restrictions

In order to prevent additional unacceptable adverse effects to fishery areas, wildlife and recreation areas of Biscayne Bay, adjacent wetlands and lakes within the site, I conclude that use of the site*/ as a disposal site should be restricted as follows:

1. That no additional solid waste (including garbage) shall be deposited in the areas covered by permit 75B-0869 and permit application 77B-0376 that are waters of the United States.

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*/ Site means that portion of the North Miami landfill which is "waters of the United States."

2. That clean fill may be deposited over the entire area already filled with solid waste. This material may be obtained from offsite upland sources of clean fill or by excavating up to 19 acres of shallow lakes (i.e., less than minus 6 feet MSL) on-site in wetland areas free of solid waste or other contamination immediately north of the mangrove preserve adjacent to the site.

3. That no fill of any kind shall be deposited in the previously unfilled waters of the United States at the site except as provided in Paragraphs 4-7 below.

4. That if necessary for temporary access roadways to the lake sites mentioned in Paragraph 2 above, clean fill may be deposited in the wetland area immediately north of the mangrove preserve in order to excavate and transport clean fill for covering the existing solid wastes.

5. That clean fill for a dike may be deposited around the periphery of the eastern edge of the existing disposal site to contain any surface leachate flows that could occur in the future.

6. That clean fill from the existing dike may be deposited, to the extent necessary to restore the original elevation, in the ditch from which such material was excavated.

7. That clean fill may be deposited as necessary for the placement of an additional culvert, as described in permit 75B-0869, or for the substitution of a bridge for the culvert.

However, specification of the site for deposition of clean fill under Paragraphs 4-7 above is subject to the following conditions:

a. That any lakes to be excavated under Paragraph 2 shall be interconnected with each other and with existing channels to Biscayne Bay.

b. That the clean fill for any temporary roads constructed in wetlands to excavate and transport clean fill shall be culverted in accordance with best engineering practice; that such fill shall be removed once the excavation and exportation is complete; and that the wetland surface shall be restored as near as practicable to its pre-filling elevations.

c. That no fill shall be obtained through the conversion of the 8.2 acre mangrove preserve required under permit 75B-0869 to a borrow area.

d. That no fill shall be obtained through the enlargement of the three shallow tidal ponds authorized under permit 75B-0869 to deeper or nontidal borrow areas.

C. Reasons for restrictions

As described in IV above, I have decided to restrict all future discharges to clean fill. The record demonstrates that the placement of solid waste creates a serious leachate problem due to the particular geological and hydrological characteristics of the site. Any further placement of solid waste in the waters of the United States will exacerbate this problem. (Placement of such materials in the upland portions of the tract is also undesirable, in light of the deep lakes which have been cut there, but the jurisdiction of the Act, and hence my 404(c) action, does not extend to the use of areas outside the waters of the United States.) The discharge of clean fill will not present this problem of contamination.

Second, I am restricting any further filling with any kind of material in the as-yet unfilled waters of the United States on the tract, with a few specific exceptions. These as-yet unfilled areas consist for the most part of mangrove-dominated wetlands. While, initially, EPA had no objection to the issuance of a permit for the filling of this area with clean fill, the changed circumstances attributable to the subsequent use of solid waste make the cumulative effect of filling this approximately 60 acre wetland more significant. Prohibiting filling of these wetlands will help attenuate the stresses which have already been suffered by the fish and wildlife of the area and which will continue to occur as a result of the garbage now in place. Biscayne Bay,

including the project area, provides a valuable estuarine area, which, while degraded from its natural character, still supports important fish and wildlife habitat. The bay, including its northern portion where the North Miami landfill is located, is making a substantial recovery from man's earlier abuses, particularly since the direct discharges of raw sewage ceased in 1956. Filling a significant portion of the unfilled wetland on the tract, coupled with the problems emanating from the garbage, will have a deleterious effect on the recovery of the aquatic resource represented by the Bay.

At the same time, I have concluded that there is no need to extend this restriction on the discharge of clean fill to those areas which have already been filled. First, because those areas have already been filled, they are no longer functioning as wetlands. Second, as noted above, clean fill will not cause the leachate problems presented by solid waste. Third, the placement of such a capping will be benefical because it will lessen erosion of the solid waste and divert some rainwater. Finally, placement of such clean fill was a condition of the State solid waste permit. No environmental purpose would be served by preventing compliance with the State's remedial condition.

The Regional Administrator's recommended determination would have required the placement of a specific depth of material. I have not adopted that requirement, first because the nature of my action is not so much to prescribe actions which must be taken as to prescribe conditions under which they may be done, and

second because I see no need to limit the level of this clean fill to a maximum depth to prevent unacceptable adverse effects on fishery, wildlife, or recreational areas.

However, I have determined that some restrictions on the source of the clean fill are appropriate. Thus, I have decided that, if the owner elects to use clean fill dredged from the site, the dredged lakes should not be deeper than minus 6 MSL or cover more than 19 acres total. This depth limitation should ensure that there will be no additional cuts into, or dangerously close to, the relatively pervious soil layers. As discussed above, one of the factors which makes the effect of dumping garbage so serious is the existance of the deep lakes which have already been dredged. Any filling made possible by the creation of more such lakes will compound those unacceptable adverse effects. This depth limitation will also incidently result in a more desirable wildlife habitat (compared to a deep lake). The limitation on the horizontal size of the lakes is related to the restriction on filling wetlands; a large portion of the remaining wetlands should remain as wetlands, rather than open water, to alleviate the stresses on fish and wildlife. (While open water clearly provides better habitat for them than filled areas would, it does not perform all the functions of the mangrove wetland.) I have selected 19 acres as the cut-off because because it will ensure a balanced habitat for fish and wildlife and also allow for recreational activities such as fishing, boating, and nature studies. (I note in passing that the ability to dredge these lakes may incidently allow the owner to reduce the cost of complying with the state requirement for a cover of clean fill.)

Although, as explained above, in general there should be no more filling in the unfilled areas, I have determined that certain limited fills may take place without unacceptable adverse effect. The beneficial effects of these fills should outweigh the small loss of wetlands involved. For example, if necessary for access to dredge the shallow lakes for fill, clean fill may be deposited for temporary roadways, if culverted according to best engineering judgment, if such fill is removed when dredging is complete, and if the area is restored as close as practicable to its original contours. So conditioned, such roadways will not create any permanent disruption of water circulation or biological productivity, and they will facilitate the capping of the solid waste with clean fill. Therefore, on balance this appears to be an appropriate exception to the general prohibition against discharges in the unfilled wetlands on the site.

Similarly, I have determined that the net effect of placement of fill in the form of a dike around the periphery of the existing disposal area (that is, the area which has already been filled) would not have unacceptable adverse effects, but would rather be beneficial because of its potential for retaining surface runoff. If the filled area is used as a golf course, we can expect runoff contaminated with fertilizers and pesticides, wholly apart from any leachate from the garbage. The data suggests that the existing dike, while not totally effective, does slow down the passage of leachate. Consequently, although a new peripheral dike would

result in the filling of a small amount of wetland, its net consequences for the aquatic system would not be unacceptable. Hence, my action does not prohibit the construction of such a dike with clean fill.

Additionally, fill material may be placed on the site as neccessary for the installation of an additional culvert as originally contemplated in permit 75B-0869 or a bridge. The beneficial effects on the environment of such a structure outweigh the small loss of wetlands which might be involved.

The above allowance of discharge of clean fill in previously unfilled areas is subject to the following conditions to ensure that such filling activities will not have unacceptable adverse effects. First, to ensure proper flushing, any lakes to be excavated shall be interconnected with one another and with Biscayne Bay. Second, as noted above, any temporary roads for dredging access must be removed when the dredging is completed and the bottom contours restored to their original elevation. This condition will ensure that there will not be any permanent disruption in water circulation. The movement of water is particularly important to the maintenance of mangrove wetland productivity and for water quality.

Finally, none of the fill material shall be obtained through the conversion of the 8.2 acre mangrove preserve (see permit 75B-0869) to a borrow area or through the enlargement of the three tidal ponds (see permit 75B-0869) into nontidal borrow

areas. Unless this condition is included, future filling will result in exacerbation of the stresses already suffered by the fish and wildlife of the area as a result of the garbage. For example, dredging the ponds to minus 35 feet MSL, as has been proposed, as opposed to minus 3 feet MSL, as originally permitted, would penetrate the extremely pervious Miami oolite and allow additional access of undesirable leachate to the groundwater. Similar effects would occur if the 8.2 acre mangrove area were used as a borrow site. On the other hand, adherance to this condition will ensure the desireable wildlife habitat contemplated under permit 75B-0869 as mitigation for filling which has been permitted.

This action of mine includes restrictions on areas specified by an existing permit. While ideally, I would prefer to use 404(c) before a permit has been issued (see preamble to the 404(c) regulations, October 9, 1979), I have the authority to, and it is sometimes necessary to, act after issuance in order to carry out my responsibilities under the Clean Water Act. This is such a case. First, at the time that permit 75B-0869 was issued, EPA did not know or have reason to believe that solid waste would be used for fill material. Second, our concerns about leachate were not immediately verified by test data. Under the record as presently developed, however, the exercise of my section 404(c) authority is appropriate to prevent unacceptable adverse effects to shellfish and fishery areas, wildlife and recreational areas.

As noted above, the focus of this action is prospective. Thus, my restrictions do not completely remedy problems caused

by past discharges of solid waste or by failure to comply with previous permit conditions. However, other remedies, such as appropriate Federal and State enforcement actions or permit modifications may complement my 404(c) action to fully clean up and protect this area. I have endeavored to describe the restrictions and conditions in this determination so as not to interfere with appropriate remedial steps.

Administrator
Environmental Protection Agency

Dated: January 19, 1981