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Ms. Amy Witryol
4726 Lower River Rd.
Lewiston, NY 14092

Electronic Delivery

RE: Economic and Fiscal Impact of the Proposed Model City, NY RMU-2 Hazardous Waste Landfill

Dear Ms. Witryol:

This letter offers our cursory review of the Bonadio and Company, LLC (Bonadio) report entitled, "The Economic and Fiscal Impact of Waste Management's Hazardous Waste Landfill on Niagara County and the Surrounding Area." The opinions we express are based on extensive experience in the field of regional economic analysis, including economic and fiscal impact estimation related to numerous public and private facilities and operations. Attached to this letter is a biographical statement and resume that incorporates a selection of representative projects in this subject area.

In general, we find that the Bonadio report has significant shortcomings with respect to offering a "best-practice" evaluation of the proposed hazardous waste facility. There are three major categories of weak or flawed analysis: First, there is no consideration of the facility's potential negative external economic effects whatsoever. Possible effects on property values and incompatible economic activities are ignored entirely. Second, the application of the RIMS II model is flawed and the possibility exists that significantly different impacts would be estimated for the direct effects that are measured if done correctly. The RIMS II model, while commonly used for low-budget regional economic impact analysis, has significant limitations for use in longer-term impact analyses, such as the subject analysis. Third, it is unclear from the report whether the estimated economic impacts were exclusive to the proposed project ("RMU-2") and only for the proposed new landfill site, or whether these included current monitoring and security activities linked to the old landfill. Finally, the analytic presentation is incomplete and confusing. Some data appear to be double counted, some are misclassified[1], some are offered for non-coincident time periods, and certain dollar-value figures have not been adjusted for inflation, rendering time-period comparisons inaccurate and misleading. Furthermore, you informed us that the regulatory applications forecast a project life of 20-25 years, not the 32-year interval presented in the report. These preclude a credible analysis of municipal revenue impacts.

[1] Certain expenditures cited by Bonadio as capital expenditures, such as recurring landfill capping, is generally treated by economists as an operating costs. The distinction is made for purposes of classifying such expenditures in the context of the economic model. As an operating expenditure, such capping produces employment during the landfill lifetime, whereas capital expenditures produce sporadic job creation that terminates on completion of the expenditures.

Taken together, the Bonadio report fails to provide a credible picture of the proposed landfill's economic impact. In the remainder of this brief review, we document some of the professional shortcomings of the Bonadio analysis and indicate the likely effect of corrections, when evident. Some of the problems, such as those related to external economic effects, may prove to be sizeable, while others, once eliminated, will correct for methodological errors and basic mathematical inaccuracies that may be minor, but should not occur in a credible economic analysis. We present these in order of importance to the estimated impact.

1. Failure to Account for Negative Externalities

Any credible economic analysis includes consideration of economic externalities, in addition to direct, indirect and induced economic effects. Economic externalities can be thought of as "spillover effects" from an activity that affects nearby businesses and households[1], such as a processing plant's discharges of contaminated water that affects a downstream plant using those public waters as in input for its production. Any resultant higher production costs for contaminant removal by downstream users are viewed as a negative externality of the initial discharge. The same action may also have a negative effect on the local fishery, which can be either commercial or sporting, and may have readily observable impacts on the lost value of fishery activity. It some instances, it can be a complex process to estimate these effects, as with reduced sports fishing coupled with tourism activity.

Even when there are significant barriers to estimating negative externality effects, it is essential that they be considered as a part of an economic impact analysis. The potential for negative externality effects needs to be recognized and clearly stated, whenever appropriate, despite the difficulty in measuring the effects. If their estimation proves too costly or otherwise too difficult to perform, regulators must still be made aware that remaining impact estimates will overstate the size of economic gains if negative externality effects are present but not priced. Positive economic externalities may also exist and, if present, should be treated similarly.[2]

In the case of the Bonadio estimates, no estimation of negative externality effects for the proposed landfill for potential property value losses and the potential for reduced tourism visitation and spending in the region is offered. In the case of property value losses, a sizeable literature exists documenting the appropriate methods for loss-estimation and amount of estimated losses in property values associated with presence of undesirable activities and land-uses. Based on estimates in the recent The Cost-Benefit Group, LLC (CBG) report you provided, property value losses of 5% to 7.5% in the towns of Porter, NY and Lewiston, NY can reasonably be anticipated to occur if a new hazardous waste site is

[1] Such spillover effects are market mediated transactions between two or more parties.

[2] Positive externalities can occur when households or businesses receive goods or services for which no payment is made or whose value increases. An oft-cited example is that of the honey producer who keeps bees that pollinate nearby crops, thus enabling commercial crop production. The beekeeper may or may not be paid for placing hives near crops. If the beekeeper is paid, we can know the value of the service and the transactions are made "internal" to the economy. If unpaid, the value still exists, but it must be imputed to accurately capture the value of the beekeeper's services.

permitted and operated in Model City. These estimates are derived from a combination of studies for similar actions in the past.[1] For these towns, they estimated a loss of 5% or approximately $83 million ($2017)[2]. Such a loss, when used as the basis for estimating the lost stream of income using imputed rental income flows from that property value, could generate annual losses equal to about 5% annually or $4.4 million per year, nearly offsetting the $5 million Bonadio estimated as a new landfill facility's direct employment compensation for the site. (Note that the site figure given by Bonadio may include employees that are engaged in activities linked to the old landfill or which are monitoring personnel employed by the State, not the landfill operator. These should not be included with the proposed new landfill's direct economic impact.)

The other externality ignored by Bonadio is the potential loss of tourism visitation and related expenditures. An introduction of undesirable activities and land-uses to an area often has a negative impact on the attractiveness of a region for travel and recreational activities. In view of the importance of travel and tourism to the local economy, the potential economic loss to the region is substantial. The tourism market in the greater Niagara region (i.e., the five western New York counties: Erie, Genesse, Niagara, Orleans, and Wyoming) is estimated for 2016 by Tourism Economics to generate approximately $2.5 billion ($2016) in annual regional sales[3]. Within the broader region, Niagara County's direct tourism spending alone represents approximately about one-quarter of the regional total or about $651 million, which generates $440 million in labor income and taxes. It is not hard to see that even a very small spending loss, say 1% loss in county tourism, would amount to about $7 million, which would be a significant effect on income of residents in the County and in the towns of Porter and Lewiston. (Note that these two towns, in turn, represent approximately 10 percent of Niagara County total population as the 2010 Census. If tourism spending were approximately proportionate to population, the losses at a town level would remain sizeable.)

We are unaware of research that specifically examines the impact of landfill siting on existing tourism markets. A possible explanation for this is that cases of new landfill siting in areas with significant tourism activity are few altogether. The negative aesthetics of waste transport and landfill operation would appear to be incompatible with tourism destined for areas of natural beauty or activities that involve recreation dependent on a clean environment, such as those noted in the CBG report[4]. Research presented by Slovic, Layman, Kraus, Flynn, Chalmers, and Gesell[5] concerning nuclear waste storage facility siting in Nevada points to a risk that is relevant here: Establishment of a new waste storage facility may reawaken dormant negative perceptions among tourists with serious consequences for the tourism activity. The region's past connection to the Love Canal disaster has the potential

[1] We have not independently verified the results of the studies cited in the Cost-Benefit Group. The 5%-7.5% range is found to be within the range of property valuation impact studies we have previously reviewed.

[2] The lost property value given by the Cost-Benefit Group is for residential property only and does not appear to include nonresidential property such as commercial, institution, or public property. Studies estimating losses associated with these property-types are not widely available.

[3] Tourism Economics. "The Economic Impact of Tourism in New York."
https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/NYS_Tourism_Impact_2016.pdf

[4] See CBG, p. 18.

[5] Paul Slovic, M. Layman, N. Kraus, J. Flynn, J. Chalmers and G. Gesell. 1991. "Perceived Risk, Stigma, and Potential Economic Impacts of a High-Level Nuclear Waste Repository in Nevada", Risk Analysis, Vol. 11, No. 4, pp. 683-696.

to influence old perceptions of the region as a dangerous area that if reinforced by a new hazardous waste landfill, could negatively affect future tourist visitation and spending.

A credible economic impact analysis needs to incorporate the estimated potential losses in income due to property value losses and losses due to tourism spending in the same type of multiplier analysis that Bonadio did for employee compensation and operating expenditures. The loss-estimates must be "entered" into the same economic model used to estimate the effect of output, income, and fiscal effects of the landfill's operations. Only then can a balanced exposition of the full effects of the operation be available for review by regulators.

2. Deficiencies Regarding Use of the RIMSII Model

One of the fundamental assumptions in input-output analysis (including the U.S. Bureau of Economic Analysis' Regional Impact Modeling System II[1] [RIMS II]) is that the within any given model-defined sector, the good or service being produced is homogeneous for all producers within that sector and that each producer uses an identical production technology to others in that industry. As a consequence, all plants in any given industry will have the same operating characteristics with respect to labor utilization, fuel usage rate, tax and fee payments as a percentage of sales, equipment lease payments per dollar of sales, and all other inputs from among the 400-plus possible inputs that comprise the model.

The sector used by Bonadio to estimate the economic multiplier effects of the proposed Model City hazardous waste landfill is "Waste management and remediation services." This category includes municipal solid waste landfills, privately operated household waste landfills, **incinerators, waste-to-energy plants, recycling facilities, remediation services for buildings, mine site remediation, soil remediation, groundwater remediation**, and hazardous waste landfills. Within this grouping, however, we note that hazardous waste landfill establishments represent an extremely small subset. Data from the 2012 Economic Census[2] indicate that less than one percent of all waste-related establishments are engaged in hazardous waste disposal, and that taken together, these account for less than two percent of the category's sales.

As modelled by Bonadio, using total spending by the proposed landfill in the Waste Management and Remediation Services industry, the implicit assumption is that privately owned hazardous waste landfills are operated in precisely the same manner as the entire group of waste handling facilities taken together. In view of the broadly defined range of activities included in this single RIMS II category, it is unlikely that the homogeneity assumption will hold for the tiny subset that is hazardous waste landfills. When the assumption does not hold in the real world, the resulting multiplier effects are likely to be significantly misestimated.

To avoid the potential for large errors in the impact estimates, a complete accounting for the direct spending of the proposed landfill operation is required. Using this detailed

[1] See https://www.bea.gov/newsreleases/industry/io/ionewsrelease.htm and https://www.bea.gov/regional/rims/index.cfm

[2] https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

information, the so called "bill-of-goods method," identified by BEA in its RIMS II User Guide[1], should be applied. This would more accurately capture the local economic linkages (and leakages from the region that would arise from use of specialized material inputs, such as geotextile liners) than the generic "Waste Management and Remediation Services" RIMS II category would depict. As it now stands, we simply do not know how large a change in the estimated impact would result from correctly modeling the landfill's indirect and induced impact, only that any economic impact analysis should incorporate this methodological correction in order to be credible.

3. Errors in Direct Impact Data Preparation

In addition to the major questions regarding project service-life, project-specific assumptions, geography distribution of direct economic impact, and missing negative externality estimates, there are several errors in the Bonadio presentation of the proposal landfill's direct economic impacts that also result in flawed estimates of total economic impacts. We note five here:

1. Bonadio notes that a host community fee of $3 per ton is to be paid to the Town of Porter will amount to a minimum of $200,000 per year, offset by the gross receipts tax. In the summary of the landfill's fiscal impact, they show a 5-year average annual host fee payment to each of the towns as $200,000 each. However, no offset value is accounted for, possibly overstating the net effect of the Porter host fee payments. This may prove to be sizeable taken over the 32-year service-life of the facility, assuming that the fee will be paid at a constant rate relative to landfill service sales. If the service-life of the facility is 20 or 25 years, the issue is no less important as regards fiscal impact.

2. Throughout the report, historical and future dollar value data are shown without adjustment for inflation effects, i.e. no conversion to constant dollars is made. These data are the basis for the five-year averages shown from which total impact is to be estimated. For example, average employee compensation for 2004-2008 is given as one type of direct impact, charitable contributions for "the last five years" (presumably, 2013-2017) is given as another, and capital expenditures for the first six years, with no mention as to which years, as another. For reference, we note that from 2004 to 2017, the value of a dollar has changed by 14 percent based on consumer price index data[2], the effects of which should be standardized before using in any economic model to a fixed base year. As it now stands, much of the dollar-value data presented by Bonadio are unclear and biased as used in their impact estimates.

3. Bonadio uses data from different economic time-periods to depict a range of conditions that have a significant effect on the direct economic and fiscal effects of the proposed landfill. The use of time-period specific historical data for the old Model City landfill requires, at a minimum, for the those values to be put in context if they are to be used as the basis for future fiscal impact estimates. Preferably, these would be

[1] See p. 5-4, https://www.bea.gov/regional/pdf/rims/RIMSII_User_Guide.pdf

[2] See https://www.bls.gov/data/#prices to obtain consumer price data.

presented with some effort made to update these for current and future conditions. For example, for the fees to be paid to the State of New York and affected towns from future landfill operations, Bonadio uses 2008 payments made by the previous landfill operations. These may not be representative of future payments based on different waste volumes at different prices anticipated for the future. Mixing data from different periods without noting significant changes economic conditions only serves to cloud our understanding of the true revenue impact of the new landfill operation.

4. Data on capital expenditures require separate handling for impact estimation if these refer to long-lived assets. Recurring capping of the landfill, however, if it is part of the normal operations, is not normally treated as a capital expenditure. Rather, it is included with ordinary landfill operating expenditures. True capital expenditures in this context, are a form of construction activity with its own set of input requirements and impact multipliers that are distinct from landfill ones. Some of Bonadio's estimated capital costs may qualify as a capital-related economic impact. However, none of the capital expenditures identified by Bonadio appears to have been included in subsequent economic impact estimates, another deficiency of the analysis.

5. It is essential that direct impact data be disaggregated for site-related expenditures (operating and capital) and those of the proposed new facility. It is incorrect to include those site-wide operating direct economic impacts that involve monitoring and maintenance of the old landfill with those of the RMU-2 facility. Doing so overstates the direct economic impact of the RMU-2 facility.

To summarize our review of the Bonadio economic impact report, we find that both the data and analysis presented for the proposed hazardous waste landfill to be professionally subaltern and inadequate as a credible basis on which to assess the likely economic impact of the facility. Aside from using one of the least sophisticated economic models with which to evaluate long-term regional economic impacts, the most notable inadequacy of the analysis is its failure to consider significant potential negative externalities associated with nearby property valuation and tourism impacts from the proposed facility's operations. In addition to this, the analysis evidences a weak understanding of the RIMS II model's basic underlying assumptions through the improper specification of the industry expenditure flows. Taken together, these shortcomings are likely to misrepresent the likely economic impacts from the project, and given the environmental risks involved, are worthy of correction.