BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PROPOSED AMENDMENTS TO	)	
CLEAN CONSTRUCTION OR DEMOLITION	)	R12-9(B)
DEBRIS FILL OPERATIONS (CCDD):	)	(Rulemaking – Land)
PROPOSED AMENDMENTS TO 35 Ill.	)	
Adm. Code 1100)	)	

NOTICE OF FILING

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Attached Service List

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board the Illinois Environmental Protection Agency's Comments on Groundwater Monitoring copies of which are herewith served upon you.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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DATE: December 3, 2012

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY'S COMMENTS ON GROUNDWATER MONITORING

The Illinois Environmental Protection Agency ("Agency") respectfully submits its comments in the above-titled matter to the Illinois Pollution Control Board ("Board") pursuant to the Hearing Officer Order of September 21, 2012.

I. OVERVIEW

Subdocket B is a continuation of the Board's Docket R12-9 amending the rules at 35 Ill. Adm. Code 1100 for clean construction or demolition debris fill operations. The rulemaking was required by Sections 3.160, 22.51 and 22.51a of the Environmental Protection Act ("Act"). 415 ILCS 5/3.160, 22.51, 22.51a (2010) (as amended by P.A. 97-0137, effective July 14, 2011). As a result of the amendments to Part 1100 in the initial docket, regulated fill operations now include both clean construction or demolition debris ("CCDD") fill operations and uncontaminated soil fill operations ("USFO").

Groundwater monitoring as proposed by the Agency in "Subpart G: Groundwater Monitoring" had both supporters and opponents during the first proceeding. At First Notice, the Board decided to strike the proposed Subpart G for reasons discussed further below. The controversy over groundwater monitoring that developed during the proceeding then followed the Second Notice proposal to the Joint Committee on Administrative Rules ("JCAR"). Working with JCAR, the Board agreed to open Docket B to provide an additional opportunity for parties

"who may not have submitted their supportive views" to provide their opinions and information. As the proponent of the amendments, the Agency fully participated in the first proceeding, but it takes this additional opportunity to support groundwater monitoring as set forth in Subpart G of its initial proposal.[1]

The initial factor influencing the Agency's proposal for groundwater monitoring is the statutory command to propose and adopt standards and procedures necessary to protect groundwater. 415 ILCS 5/22.51(f)(1), 22.51a (d) (2010). This indicates to the Agency that the legislature already has concluded there is potential for groundwater contamination from facilities accepting large quantities of soil from nearly unlimited sources and locations that may contain concentrations of contaminants. The question for the rulemaking is not whether there is current evidence of such contamination but rather how groundwater protection will be accomplished considering the potential for such contamination. The Agency agrees with the Board's interpretation that groundwater monitoring is not specifically required by the statute. It is one of the measures that should be considered to achieve groundwater protection. In the Agency's view, it is the single most important measure for achieving groundwater protection.

Consistent with the statutory requirements in Section 3.160(c) of the Act, the Agency's initial proposal envisioned protection of "human health and safety and the environment" using a multi-barrier approach at fill operations accepting soil generated during construction or demolition activities: (1) numeric standards protective of three human exposure routes for

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[1] In this document, the Board's First Notice Opinion and Order is cited as "First Notice Opinion [Order] at ___." The Second Notice Opinion and Order is cited as "Second Notice Opinion [Order] at ___." Exhibits are cited as "Exh. ___ at___." The transcript of the September 26, 2011, hearing is cited as "TR 1 at ___"; the transcript of the October 25, 2011, hearing is cited as Tr. 2 at ___"; the transcript of the October 26, 2011, hearing is cited as Tr. 3 at ___"; the transcript of the March 13, 2012, hearing is cited as Tr. 4 at ___; and the transcript of the March 14, 2012, hearing is cited as Tr. 5 at ___. The Agency's Statement of Reasons is cited as "SOR at ___." The Agency's Pre-First Notice Comments are cited as "PC#9 at ___." The Agency's First Notice Comments are cited as "PC#39 at ___." The Agency's Response to First Notice Comments is cited as "PC#47 at ___."

maximum allowable concentrations of contaminants in the "uncontaminated soils"; (2) soil certification requirements for construction/demolition source site owner/operators and screening procedures for fill operations; and (3) groundwater monitoring for fill operations. No single barrier would provide complete protection of human health, safety and the environment, but each would contribute an important aspect of the necessary protection.

The first barrier consisted of the establishment of uniform, statewide maximum allowable concentrations ("MAC") of chemical constituents in "uncontaminated soil" based on the Tier 1 residential remediation objectives previously vetted and promulgated by the Board at 35 Ill. Adm. Code 742. *See* 35 Ill. Adm. Code 1100.Subpart F. These objectives are protective of human health for three potential human exposure routes: ingestion, inhalation and groundwater ingestion (MACs pertain to the soil component of the groundwater ingestion exposure route).[2] The Board adopted Subpart F of the Agency's proposal with a significant revision for pH-sensitive constituents. The Agency appreciates the Board's adoption of this important component of the rules.

The second barrier for protection of human health and the environment was to be based on what have been loosely referred to as "front-end" controls -- the certification and screening requirements for identifying and excluding contaminated soil before it is delivered to or accepted at fill operations. In the Agency's initial proposal, the certification requirements applied to the owner/operators of sites where the soil is generated ("source site owner/operators"). Source site owner/operators were obliged to determine whether or not properties where the soil was generated were "potentially impacted properties" (*i.e.*, potentially impacted by contamination

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[2] In some cases, the Tier 1 residential objectives were modified to reflect more stringent values for the construction worker ingestion and inhalation exposure routes. In others, the Tier 1 residential objectives were modified using statewide area background values under 35 Ill. Adm. Code 742.405(b)(1). It also should be noted the MACs are not fully protective of the environment. For example, vapor intrusion, surface water, and avian and aquatic receptors are not addressed by the MACs. This is why the MACs are not generally applicable standards for "uncontaminated soil" but instead apply only to soil in the fill operation context. 35 Ill. Adm. Code 1100.101(b)(1), 1100.600(b).

from current or historic activities at the site or adjoining sites). If the property was not a potentially impacted property, the owner/operator could certify in writing that the property was not potentially impacted by contamination and the soil was presumed to be uncontaminated. If the owner/operator determined the property was a potentially impacted property, evaluation and certification by a licensed professional engineer or geologist that the soil is uncontaminated was required.

The Agency's proposal essentially codified the interim statutory requirements for certifications, which allowed certifications by source site owner/operators to be based on personal knowledge of a property's current and historic uses and allowed professional engineers and geologists to certify soil as "uncontaminated" based on professional judgment. The Agency did not propose more specific standards for making the "potentially impacted" determinations or for the evaluations by professional engineers or geologists in part because the wide variety of properties and circumstances were not considered amenable to a one-size-fits-all approach to evaluations, in part because the Agency was proposing groundwater monitoring as a final check on control practices, and in part because the Agency did not believe time-consuming and costly regulatory burdens should be placed on construction and demolition activities. Rather, the Agency believed the statutory interim procedures reflected an intention that construction/demolition activities should proceed with as little disruption as possible and that the primary burden for environmental protection should be placed on the fill operations as the regulated entities. Presumably, the costs of the additional regulation would be allocated proportionately across all source site owner/operators through adjustments to tipping fees.

The second element of the "front end" controls was the screening requirement to be performed by the fill site operators at the facility gate. Load-checking already was required by the existing Part 1100 rules, and the Agency workgroup, after considerable inquiry and

discussion, found that little, short of additional sampling and analysis, could be added to the existing procedures at the gate that would significantly improve the ability to detect and reject contaminant concentrations exceeding the MACs.[3] The existing Part 1100 procedures at fill operations required fill site operators to inspect each load visually and with a photo ionization detector ("PID") or similar instrument and to perform at least one random inspection daily of a discharged load using the same procedure. The Agency proposed the addition of a requirement to collect the written certifications and supporting documentation from source site owner/operators and/or professional engineers or geologists while strengthening fill site screening documentation and load rejection requirements.

The third and single most important protective barrier in the Agency's initial proposal was groundwater monitoring for the fill operations. The Agency believed the certification and screening procedures were of limited effectiveness – that they could provide a basic level of protection but could not be relied upon to provide a consistently high level of protection by all soil generators at all fill operations for all potential contaminants and all soil accepted at fill operations over an indefinitely long period of time. In the Agency's view, groundwater monitoring was an important "back-end" control that would serve as an early warning of any groundwater contamination that might result from the quantities of soil deposited in unlined quarries, mines or other excavations. Such excavations have been identified as "potential routes" for migration of contamination to groundwater resources. 415 ILCS 5/3.350 (2010). Groundwater monitoring was to be the sentinel standing watch over the entire regulatory structure to ensure that off-site groundwater was not contaminated or degraded as required under 35 Ill. Adm. Code 620 and other provisions of Illinois law.

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[3] Additional sampling and analysis of loads at the gate were understood to be impractical as they would require substantial procedural and logistical changes to fill site operations for across-the-board segregation and testing procedures prior to final placement for disposal.

The Agency remains convinced that groundwater monitoring is a necessary element of the regulation of fill operations. A review of the following documents submitted by the Agency in the initial docket will provide a more detailed discussion of the Agency's reasoning and conclusions regarding groundwater monitoring: "Pre-Filed Testimony of Richard P. Cobb, P.G., on Pollution Control Board's First Notice Proposal," Exh. 26 at 2 – 21; "Illinois Environmental Protection Agency's First Notice Comments," PC # 39 at 2 – 14.

The remainder of this comment addresses the five specific areas of concern listed for the Docket B comment period in the Hearing Officer Order of September 21, 2012. These concerns are: (1) the costs of groundwater monitoring; (2) the parameters to be monitored; (3) the design of a groundwater monitoring system, particularly placement of wells; (4) whether or not the groundwater monitoring should be self-implementing; and (5) the lack of evidence that groundwater is being impacted by properly run facilities. The Agency first discusses concerns (1) and (5) in Section II of the document. Concerns (2), (3) and (4) are discussed in Section III of the document. The document also includes new information in Section II(B)(1) below for the costs of designing groundwater monitoring systems and in Section II(B)(2) below for the costs of responding to groundwater contamination incidents affecting water supplies. Finally, a special comment concerning Subpart F and Section 1100.600(d)(2) is provided in Section IV below.

II. GROUNDWATER MONITORING SHOULD BE REQUIRED AT FILL OPERATIONS

A. The Lack of Evidence that Groundwater Is Being Impacted by Properly Run Facilities

At First Notice, the Board stated the record did not support a groundwater monitoring requirement for fill operations because "no evidence was provided to demonstrate that CCDD or uncontaminated soil fill sites were a source of groundwater contamination." First Notice Opinion at 1. At Second Notice, the Board repeated in a more nuanced way that its threshold requirement for groundwater monitoring had not been met. "The record lacks any evidence that

facilities operating within the law are currently contaminating wells or are likely to contaminate the wells." Second Notice Opinion at 87.

In the Agency's opinion, no conclusion on the wisdom of requiring groundwater monitoring can be drawn from the current absence of evidence in the record of groundwater contamination from fill operations. The Board has concluded that the absence of such evidence is decisive, apparently without considering two important countervailing factors: (1) The absence of evidence of groundwater contamination from fill operations is not proof that fill operations have not and cannot cause groundwater contamination, and nothing in the record demonstrates fill operations have not or cannot cause groundwater contamination; and (2) the reason there is no evidence either way is that, insofar as the Agency knows, no one has been looking for it. There is no current monitoring requirement or reporting requirement and therefore no systematic effort to resolve the question either way. Moreover, there will be no such effort unless the Board or the legislature requires groundwater monitoring. Further, the question is not whether such contamination is "likely" but whether the potential for groundwater contamination exists at fill operations regardless of how likely it might be at any particular facility.

Under these circumstances, requiring evidence of groundwater contamination from fill operations before the adoption of groundwater monitoring at fill operations establishes a threshold for groundwater monitoring that cannot be met short of groundwater contamination so serious and widespread that one or more aquifers have been damaged to the point where private and public users of the aquifers make the discovery in their potable water wells. Instead of fill site owner/operators monitoring their own activities and passing costs on to the soil generators, the potable water well owners become the "canaries in the coalmine." Even then, contamination may not be discovered expeditiously because most contaminants do not affect taste or odor at human health-based concentrations such that private well owners would be prompted to initiate

testing of their wells for chemical contaminants. Once contamination is discovered, an evidential link to the source also will be required to satisfy the standard for action set by the Board -- an often difficult task for contamination plumes migrating through developed areas and complex geology. On-site groundwater monitoring would provide direct evidence of the presence or absence of contamination from fill operations in time to take corrective action if necessary.

The Agency's position is that the potential for fill operations to cause groundwater contamination is a sufficient basis for the Board to require groundwater monitoring. Because the concern about groundwater contamination from fill operations currently cannot be resolved either way based on evidence of contamination or the absence of such evidence, the groundwater monitoring issue must be decided on the basis of secondary factors, experience and judgment as informed by the State's and the Board's decades-old policy of preventing groundwater contamination and protecting groundwater resources. The Agency listed several secondary factors the Board should consider in weighing the potential for groundwater contamination and the need for groundwater monitoring: (1) The likely acceptance of contaminated soil because of imperfect certification procedures, imperfect implementation of the certification procedures, and the limitations of the screening tools available to fill site owner/operators; (2) the large quantities of soil accepted at many facilities; (3) the frequent placement of the soils in the saturated zone; (4) the nearly complete absence of design controls such as liners to prevent contaminant migration to groundwater; and (5) the impracticality of installing or retrofitting design controls such as liners in former quarry operations. Pre-Filed Testimony of Mr. Cobb, Exh. 26 at 18, 20.

Additional secondary factors weighing in favor of groundwater monitoring are the possible consequences of groundwater contamination if not prevented -- diminishment of the groundwater resource and the possibility of contamination plumes reaching potable water wells

or other contamination-sensitive natural resources. Unfortunately, groundwater contamination incidents are not uncommon in Illinois. The consequences are potentially severe and costly, and they must be prevented if possible. *Id.* at 14 – 19. Agency exhibits demonstrated that many fill operations are located in areas (1) geologically susceptible to groundwater contamination; (2) with significant and increasing current and future demand for fresh water, and (3) within 2500 feet or less of hundreds of existing community water supply ("CWS") wells, non-community water supply wells, private water supply wells, and sites with Class III Special Resource Groundwater.[4] *Id.*; Exhs. 27 – 32 (showing potential for aquifer recharge relative to CCDD and uncontaminated soil fill operations and the relationships between fill operations and potable water supply wells in six northeastern Illinois counties); Comments of Jenny Skufca, Natural Areas Defense Specialist, Illinois Nature Preserves Commission (PC # 49). In addition to the diminishment of the resource itself, the discovery of contaminated wells usually demands immediate response and remedial actions with government as the first responder and public resources as the funding. Once wells are threatened, the costs to government and the public are invariably substantial. Pre-Filed Testimony of Mr. Cobb, Exh. 26 at 14 – 19.

The Agency emphasizes it is not suggesting that any specific facilities are currently, or will become, sources of groundwater contamination. The Agency's larger point is that CCDD and uncontaminated soil fill operations must be considered to have the potential to cause groundwater contamination. Because of the State's policy of preventing groundwater contamination and protecting groundwater resources for current and future beneficial uses, this potential is reason enough to justify groundwater monitoring at fill operations. This policy, the importance of the groundwater resource, and the remediation and response costs for

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[4] Class III Special Resource Groundwater is groundwater that is determined by the Board to be: (1) demonstrably unique and suitable for application of a water quality standard more stringent than the otherwise applicable groundwater quality standard, or (2) vital for a particularly sensitive ecological system. 35 Ill. Adm. Code 620.430.

contaminated groundwater require that any uncertainties be resolved in favor of groundwater monitoring.

At Second Notice, the Board acknowledged that policy considerations such as the protection of groundwater may be sufficient authority for adopting a rule, but it declined to do so in this proceeding. Second Notice Opinion at 87 - 8. The Board stated its belief that "something more is required in this case where the record merely reflects that groundwater contamination is possible if the rules are not followed." *Id.* at 88. The Board further stated its confidence that its decision to strengthen soil certification and testing and recordkeeping would protect groundwater from contamination and further the state's policy without groundwater monitoring. *Id.* at 89. The Board noted in support of its conclusion:

> The Board understands that mistakes can be made and that there are persons who may choose to ignore the law. However, the rules do provide checks at the fill sites to alleviate the potential for source site owners/operators to make mistakes. Furthermore, LPE/LPGs will be certifying that soils meet MACs from [potentially impacted properties] and errors by LPE/LPGs have ramifications for them professionally. Thus, the Board is convinced that the rules provide checks and balances against errors and persons who may choose to ignore the law.

Id. at 87.

To be clear, the Agency's argument has been that the potential for groundwater contamination from fill operations exists even if the rules are followed. The likelihood that the rules will not be followed in all cases and at all times only strengthens the Agency's argument. Although the Board removed its specific requirement to use the ASTM 1528-06 due diligence procedure for site assessment, accurately assessing potential impacts using the guidance documents referenced by the Board is not a simple task nor will it further the source site owner/operators' direct interests. It can only increase costs and delays for source site owner/operators. For all source site owner/operators to achieve a high level of accuracy using the Board's procedures will require familiarity with complex legal, environmental and technical

concepts, knowledge of legal, real estate and environmental databases and the proficiency with computers to search them, diligence in the performance of the assessment (*e.g.*, willingness to invest the time and money necessary to track down and resolve uncertain details), and motivation to reach a complete and accurate result (*e.g.*, appreciation for the possible consequences of inaccuracy).[5] While the Agency assumes most source site owner/operators will make a good-faith effort to comply most of the time, it does not assume that the evaluations required by the Board will be perfectly performed or that soils contaminated above the MACs will never enter fill operations. This is why groundwater monitoring is needed as a cross-check at fill operations.

Once source site properties have been determined by their owner/operators to be potentially impacted, and LPEs or LPGs have been hired to investigate further and to take samples for analysis, the Agency still does not expect perfect results even though the rules have been followed. What the Agency expects from professional certifications is that the LPE or LPG has followed the accepted procedures for systematic evaluations, and, where judgment is required by those procedures, has exercised that judgment consistent with his or her professional training and experience. Everyone understands that even with procedures for systematic evaluations, the results are "representative" and not absolute guarantees. There will be variations in application and results even with sampling and analysis, and two professionals could reach different conclusions after evaluations of the same property. Mr. Clay testified at length about the way the Agency views such certifications and the expected variability – it's built into the system. Testimony of Douglas W. Clay, P.E., Tr. 4 at 91 – 95. These evaluations are complex matters requiring the application of complicated procedures and professional judgments. As

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[5] In its First Notice Comment, the Illinois Association of Aggregate Producers stated that, between approximately August 2010 and April 18, 2012, 2914 certification forms were received at four of the facilities represented by the IAAP. 1833 were source-site owner/operator certifications (Forms LPC-662) and 1081 were LPG/LPE certifications (Forms LPC-663). PC # 34 at 2. Approximately 63% were the non-professional certifications where no analytical sampling for compliance with the MACs is required by the rules.

with any profession, results will vary, but the Agency does not assume it means the consultant did anything wrong or there has been an improper certification. *Id.* at 94. What the Agency does not expect is that such evaluations will ensure that soils contaminated above the MACs will never enter fill operations. This is another reason why groundwater monitoring is needed as a cross-check at fill operations.

If the Board is relying on the load-checking procedures by fill operations as the antidote to its imperfect certifications, this is also unrealistic. The load checking and screening procedures at the gates of fill operations are clearly less than comprehensive. These procedures rely on visual and olfactory observations of loads and the use of photo-ionization detectors ("PID"). Contaminants with the potential to contaminate groundwater may be classified based on contaminant characteristics. Categories include volatile organic compounds ("VOC"), semi-volatile organic compounds ("SVOC"), poly-nuclear aromatic hydrocarbons ("PAH"), and inorganics including metals.

Only the most obvious manifestations of certain contaminants such as petroleum-based contaminants will be susceptible to visual or olfactory observation. The PID is useful for certain contaminants but has its limitations and hardly can be counted on to detect all contaminants with the potential to contaminate groundwater. While PIDs are capable of detecting concentrations of certain organic and inorganic vapors in the air, it can detect only those gases with ionization potential near to or less than the rating of the instrument's intrinsic energy source. If the ionization potential of the gas is greater than that of the energy source, the detector will not detect the gas. When properly maintained and calibrated, the PID is useful for detecting the presence of many aromatic and large molecular hydrocarbons, some smaller organic molecules, and some halogenated hydrocarbons. However, it will not detect most SVOCs, PAHs and metals. In addition, the PID is susceptible to calibration errors, interferences from weather

conditions (*e.g.*, humidity, fog, precipitation, windy conditions), interferences from electrical fields or signals (*e.g.*, power lines, transformers, radio transmissions), and interferences from unrelated sources (e.g., combustion engine exhaust and stack emissions). Again, the Agency believes the properly calibrated and maintained PID is useful and effective for its intended purpose. The point is that its intended purpose is to detect a range of contaminants much narrower in scope than the range of contaminants with the potential to contaminate groundwater. Testimony was introduced about using x-ray fluoroscopy ("XRF") to detect the presence of metals, but this method is very expensive and simply not practicable for the purpose of determining metals concentrations at the MAC levels, especially for soil that has been excavated and loaded into trucks as compared to undisturbed ground. Pre-Filed Testimony of Douglas W. Clay, P.E., Exh. 33 at 6 – 8 (discussing several limitations of x-ray fluoroscopy as a screening device for metals in this scenario); Testimony of Paul Purseglove, Tr. 4 at 193 – 94. Clearly, there are many contaminants that will escape detection by the PID and visual and olfactory screening procedures. This is another reason why the front-end procedures counted on by the Board to provide complete protection for groundwater resources will not, in fact, provide protection at that level and why groundwater monitoring is needed as a cross-check at fill operations.

In testimony and comments, the Agency has insisted and continues to insist the Board may adopt groundwater monitoring requirements for facilities based on their potential to cause groundwater contamination. As noted above, the Board has acknowledged it has this authority. The Board's requirement that evidence of contamination from fill operations must be presented before it will adopt groundwater monitoring is not an appropriate standard. It is inconsistent with the state's long-standing policy of preventing groundwater contamination and preserving groundwater resources for their highest current and future uses. Pre-Filed Testimony of Mr.

Cobb, Exh. 26 at 9 – 14; Agency's First Notice Comments, PC # 39 at 9 – 10. This policy has been in place since at least the mid-1980's and is embodied in the Act itself, the Groundwater Protection Act, court cases, and Board opinions in regulatory proceedings and contested cases. Pre-Filed Testimony of Mr. Cobb, Exh. 26 at 9 – 14 (citing numerous sources including 415 ILCS 5/11(b); 5/12(a), 12(d); 5/31(d); 5/3.315 (2010); 415 ILCS 55/2(b) (2010)).

When an approach similar to what the Board has adopted in Part 1100 was recommended for certain existing and new activities in setback zones or regulated recharge areas in PCB R89-5, the Board rejected the approach.[6] In its Final Opinion, the Board repeatedly mentioned or referenced the potential for contamination from the regulated sources and the preventive nature of the rules it was promulgating. The Board noted that Sections 14.4(b) and (d) of the Act prescribed the control factors it must consider as part of the rulemaking including groundwater monitoring, recordkeeping and reporting, technical standards for pollution control, and requirements for closure and discontinuance of operations. PCB R89-5, Final Opinion at 18. The Board subsequently concluded that adoption of groundwater monitoring for most of these potential sources was warranted. In response to suggestions about the groundwater sampling frequency at certain facilities handling pesticides and fertilizers and whether sampling should be required at all in the absence of detection of a possible release by another "off-site sampling entity," the Board stated:

> The Board does not believe that eliminating all monitoring required for affected pesticide and fertilizer facilities is acceptable as a rule-of-general-applicability. Neither does the Board believe that it would be acceptable to require monitoring only after off-site occurrences of contamination have been recognized. Either circumstance is viewed as not compatible with the mandate or the IGPA to reduce risk to the State's groundwaters. The Board agrees with the Agency that the monitoring component of the proposed regulations is "an essential element of the

[6] "In the Matter of: Groundwater Protection: Regulations for Existing and New Activities within Setback Zones and Regulated Recharge Areas (35 Ill. Adm. Code 601, 615, 616 and 617) ("Technical Standards")," PCB R89-5, Final Order: Opinion and Order of the Board (December 6, 1991).

> groundwater protection scheme, providing notice of contamination in its earlier stages", and allowing for initiation of non-degradation and preventative response measures to maintain or restore the integrity of potable supplies (citation omitted). This preventative aspect of the regulations would be lost should the Board only require groundwater monitoring after contamination is discovered at an off-site location.

Id. at 29-30 (emphasis added). This is precisely the argument the Agency is making in the current proceeding, and there are other similarities with the fill operations as well. Parts 615 and 616 apply to relatively small commercial operations including existing businesses under Part 615; the underlying statutory provision did not require monitoring but only that the Board consider it along with other listed control measures; although the Board noted there was a history of agrichemical groundwater contamination, it did not conclude that all such facilities would have releases. Rather, the Board concluded "both the existence and potential for serious contamination of groundwater by pesticides and fertilizers" were grounds for the regulations. *Id.* at 17 (emphasis added).

For the reasons stated above, perfection will not be achieved with the certification and screening tools relied upon by the Board to exclude soil with contamination exceeding the MACs. It is inevitable that at least some quantities of soil exceeding the MACs will find their way into fill operations. In many operations, if not most, there are no barriers between the fill and groundwater. Excavations for the discovery, development or production of stone, sand or gravel are known to be "potential routes" for contamination to groundwater. 415 ILCS 5/3.350 (2010). Whether or not the contaminants finding their way into fill operations will create significant groundwater contamination is currently unknown, but the potential for contaminants at fill operations that could cause groundwater contamination cannot be denied. Both policy and prudence dictate that groundwater monitoring at fill operations is the critical mechanism for identifying and containing any groundwater contamination before it leaves the property and is essential for obtaining a complete picture of the long-term effects of fill operations on

groundwater.

The position the Board has adopted that evidence of groundwater contamination from fill operations is necessary before groundwater monitoring may be required at fill operations seems reasonable on its surface. However, in the mid-1980's when Illinois' fundamental principles of groundwater protection and resource preservation were laid down, Board members realized after extensive examination that a more proactive approach than waiting for the discovery of actual contamination would be necessary. Following a study of Illinois groundwater quality by the Department of Natural Resources and the submission to the Board of a plan to protect groundwater quality by the Agency as required under Public Act 83-1268, the Board conducted seven days of hearings across the State. It published a final report (In the Matter of Protecting Illinois Groundwater, PCB R86-8, August 28, 1986 (Report of the Board (by R. C. Flemal)) ("Flemal Report"). This report set forth guiding principles for the foundation of a groundwater protection program, and several of the general findings in the Flemal Report still are relevant to this proceeding, among them:

► [G]roundwater protection is predicated on maintaining quality of a resource; hence, demonstration of contamination should not be a condition necessary to justify institution of programs to prevent groundwater contamination; . . .

► [R]emediation of groundwater contamination is likely to be difficult and expensive; accordingly, the primary long-term measures for protecting groundwater resources are those that prevent contamination; . . .

► [G]roundwater monitoring needs to be expanded . . .

► [G]roundwaters may not be amenable to a standard of protection at other than that of the highest potential use without risk of long-term or permanent loss of the highest use . . .

Flemal Report at ii – iv (emphasis added). The Flemal Report became the basis for Public Act 85-863, which created the Illinois Groundwater Protection Act ("IGPA") [415 1LCS 55] and amended the Environmental Protection Act accordingly.

Twenty-six years later, the principles of groundwater protection stated by Dr. Flemal and

the Board are as fundamental to Illinois' groundwater protection policy as they were when first enunciated. They could not be stated more clearly. The Agency respectfully requests that this Board follow the lead of its predecessors, reconsider its decision to strike groundwater monitoring requirements from the Part 1100 rules, and restore the Agency's proposed Subpart G: Groundwater Monitoring.

B. Costs Associated with Groundwater Monitoring

The costs associated with groundwater monitoring must be considered from two perspectives: (1) the costs of monitoring; and (2) the potential costs of not monitoring. At Second Notice, the Board noted the presentation of monitoring well system cost information by the Agency, Waste Management of Illinois, Inc. ("WMI"), and the Illinois Association of Aggregate Producers ("IAAP"). Second Notice Opinion at 88 – 9. In addition, the Agency provides new information in this comment regarding the costs of groundwater monitoring system design.

1. Costs of Monitoring Well System Design, Installation, Sampling and Analysis

The information presented by the Agency in the initial proceeding estimates the costs for installation of a hypothetical five-well monitoring system and the annual costs of sampling and analysis. The Agency noted that, in practice, monitoring systems would be designed based on site-specific factors and that the Agency's example is based on certain stated assumptions that would not be present at each fill operation. The Agency also acknowledged the information it provided in the first proceeding does not include groundwater monitoring system design costs and system maintenance costs. The Agency provides new information below regarding the costs of groundwater monitoring system design. For a complete understanding of the Agency's figures from the first proceeding and underlying assumptions, interested persons should refer to the Agency's First Notice Comments, PC # 39 at 23 - 7, Attachments 5, 6.

Based on actual well installation examples and reimbursement rates from the Leaking Underground Storage Tank Program, the Agency estimated bedrock drilling costs at $100 per foot and unconsolidated material ("UM") drilling costs at $45 per foot. PC # 39, Attachment 5, notes 5, 10. Based on the experience of the Bureau of Land Permit Section staff, the Agency also estimated the average depths of monitoring wells at facilities located in bedrock geology at 150 feet and of wells at facilities located in UM at 30 feet. *Id.* at note 4. The Agency found that the costs of installation for a five-well system would be approximately $75,000 for bedrock facilities and $6750 for UM sites. PC # 39, Attachment 5.

Overall, the Agency concluded, based on its stated assumptions and limitations, that the estimated costs for installation of groundwater monitoring wells "for approximately 96% of the CCDD disposed of at CCDD fill sites [in 2011] (a total of 3,217,118 cubic yards) are less than $0.10 per cubic yard [over the 10-year life of a permit]." Further, the estimated cost "for approximately 99% of the CCDD disposed of at fill sites [in 2011] (a total of 3,315,858 cubic yards) is less than $0.50" [per cubic yard over the 10-year life of a permit]. PC # 39 at 26. If fill volumes increase or if fill sites accept material for more than ten years, the average cost per cubic yard will be even lower. New information provided below demonstrates that additional costs for the design of monitoring systems would not significantly alter these totals.

As a landfill owner/operator, WMI certainly would have experience with monitoring well installation, presumably in a variety of geologic conditions. The information provided by WMI is consistent with the information provided by the Agency. WMI's costs of monitoring well installation are based on six examples of four-well monitoring systems installed at locations in the Chicago area, central Illinois and southern Illinois. PC # 33a at Exhibit A. System design costs apparently are not included. Although it's not entirely clear, it appears at least the two higher-cost wells were installed in bedrock and at least the three lower-cost wells were installed

in UM. *Id.* The cost of well installation in UM ranges from $42.50 to $58.33 per foot (and possibly as high as $65.42) plus mobilization charges of $300 to $1000 for total costs of $5400 to $8000 (or possibly as high as $8550). *Id.* The cost of well installation in bedrock ranges from $81.50 (and possibly as low as $65.42) to $90 per foot plus mobilization charges of $1200 to $1250 for total costs of $11,030 (or possibly as low as $8550) to $12,000. *Id.* WMI concluded the increased costs per ton of groundwater monitoring for many tons of soil over many years would be "insignificant, being a few pennies per ton." *Id.* at 1.

The Illinois Association of Aggregate Producers presented costs obtained from Mr. Wilcox for the design and installation of a six-well groundwater monitoring system at Bluff City Materials. Illinois Association of Aggregate Producers ("IAAP") First Notice Comments, PC # 34 at 2 – 3. The IAAP comment states the "costs to determine groundwater gradients – before filling, after filling and to establish testing and monitoring wells for this site as proposed by IEPA would be approximately $350,000." *Id.* at 3. Sampling and analysis costs for the six wells were estimated at $20,000 to $25,000 annually. *Id.*

The figures presented by Mr. Wilcox are much higher than those presented by the Agency and WMI. However, the costs for the wells and for the sampling and analysis are presented as lump sum totals and are not itemized or reduced to a cost per sample, cost per foot, or cost per cubic yard or ton, so it is difficult to make cost comparisons or generalizations for other facilities. Based on the Agency's figures, the annual cost of sampling per site would be $1000, and the sample analysis costs would be $2000 per sample annually. Agency's First Notice Comments, P.C. # 39 at Attachment 5. The Agency's figures are based on the costs provided in the record by Mr. Hock, also representing the IAAP. Testimony of John Hock, P.E., Tr. 2 at 34. With six wells, the Agency's estimate of the annual costs of sampling and analysis for the Bluff City system would be $13,000, so the cost estimates provided by the IAAP for

Bluff City are over 50% to nearly 100% higher than figures based on the earlier testimony for the IAAP.

The monitoring system is said to consist of six wells located around a "1000 acre sand and gravel mine." *Id.* at 2. The purpose of installing the system was "to determine if there would be any impact to the groundwater flow for the Bluff Springs Fen" and "to determine upstream and downstream gradients and the modeling to determine groundwater flow rates." *Id.* The depths of the monitoring wells and the drilling costs per foot are not provided, but using the Agency's estimates of $45/foot for drilling 30-foot wells in UM, the cost for installation of the six wells would be $8100 leaving an additional $341, 900 to be accounted for. Using WMI's highest cost for installing wells in UM of $65.42 per foot, the cost, including the mobilization fee of $700, would be $12,376 leaving an additional $337,624 to be accounted for. The higher WMI cost ($65.42/ft.) of six 150-foot wells in UM would be $59,578 (including mobilization) leaving $290,422 to be accounted for. The higher Agency cost ($100/ft.) for six 150-foot wells in bedrock would be $90,000 leaving $260,000 to be accounted for.

The Agency does not know all the facts concerning the Bluff City estimate, but given the figures provided above, it believes additional information on the specific fill operation monitored, the reasons for initiating monitoring at the Bluff Spring Fen, the nature of the geologic materials in which the wells are installed, the depths of the wells, the costs per foot for installation, the system design costs, any special circumstances at the site affecting costs, and other related costs necessary to reach the total of $350,000 are needed before the Bluff City figures can be factored into any determination of the economic reasonableness of groundwater monitoring at fill sites. Nonetheless, the Agency notes that, even at $350,000, allocating the costs to the Gifford East facility that received almost 360,000 cubic yards of CCDD in 2011 would result in a cost of 10¢ per cubic yard at the same rate of acceptance over the ten year life

of a permit – still an insignificant cost increase compared to landfill tipping fees.

Since the initial proceeding, the Agency has obtained from three environmental consulting firms cost estimates associated with the design of a groundwater monitoring system for a CCDD fill operation. As noted above, the Agency and others already have presented figures for monitoring well installation, sampling and analysis. Similar to the Agency's earlier estimates, the hypothetical site for the design estimates included the following characteristics: (1) open pit mine 1,000 feet by 1,000 feet; (2) unconsolidated overburden 35 feet thick; (3) mine excavated 150 feet into limestone bedrock; (4) production of stone completed; (5) no additional exploration needed to determine groundwater flow characteristics; and (6) five monitoring wells to be finished as open holes in bedrock.

To summarize, the estimates based on the Agency's scenario contain minor differences in approach, but they generally include costs for basic elements of a groundwater monitoring system plan: (1) investigation; (2) site monitoring well placement; (3) groundwater sampling program design; and (4) monitoring data evaluation. The investigation portion includes research into regional and local geology and hydrogeology (e.g., literature review, water well records search (*e.g.*, Illinois EPA, Illinois State Geologic Society, Illinois State Well Survey), mining records). The monitoring well placement portion of a plan includes determination of monitoring well locations (based on investigation phase), monitoring well installation methodology, and monitoring well sealing and abandonment procedures. The monitoring program design portion includes sampling procedures (detailed methodology for collection, preservation and delivery), parameter list, sampling schedule and reporting requirements and procedures. The monitoring data evaluation portion addresses the statistical approach of the evaluation of monitoring results to determine existing water quality. This information will be used to determine if groundwater is being impacted by a fill operation and to assess potential corrective measures.

Each of the firms presented estimates for preparing groundwater monitoring system plans in the form of cost ranges. Cost ranges were used to accommodate certain variables such as hours, professional labor rates, and expenses such as travel/per diems. The ranges were from $5000 on the low end (low hourly rates, minimum time frame and other expenses) to $18,000 on the high end (high hourly rates, maximum time frame and other expenses). One of the estimates also included costs for site activities including well drilling, which the Agency already has addressed in its well installation figures above, so the Agency has adjusted that estimate accordingly to make the comparisons based on minimal or no site activities.

Using the highest figure of $18,000 from the estimated ranges for the costs of designing a basic groundwater monitoring system, the Agency has revised its cost figures from above for monitoring well installation to include the design costs. Again, these estimates are based on the discussion in the Agency's First Notice Comments including the stated assumptions and limitations. PC # 39 at 23 – 27, Attachments 5, 6. They apply only to CCDD fill sites, not USFOs. The Agency has no data on the quantities of soil accepted at USFOs. PC # 39, Attachment 6 demonstrates that an individual facility's ability to allocate the costs per cubic yard will depend on the volume of material accepted at that facility. Overall, however, the combined costs of monitoring well system design and well installation at CCDD fill operations would be less than $0.12 per cubic yard over the ten year life of the permit (assuming the 2011 rate of acceptance) for approximately 96% of the CCDD disposed of at CCDD fill sites in 2011 (a total of 3,217,118 cubic yards). The combined costs of monitoring well system design and well installation would be less than $0.52 per cubic yard over the 10-year life of a permit (assuming the 2011 rate of acceptance) for approximately 99% of the CCDD disposed of at fill sites in 2011 (a total of 3,315,858 cubic yards).

This modest increase for design costs of an additional two cents per cubic yard or less

reinforces the Agency's previous conclusion that increases in costs from groundwater monitoring would result in higher tipping fees at fill operations, but the increase would not be unreasonable considering the large measure of protection for groundwater resources offered by groundwater monitoring. In testimony provided at hearing the cost of disposing of material at fill sites was stated to be approximately $3.50 per cubic yard by Mr. Huff and $4.66 per cubic yard based on information provided by Mr. Metz. Testimony of Mr. Huff, Tr. 4 at 100; Pre-Filed Testimony of Mr. Metz, Exh. 43 at 5. The cost of disposing of the same material in a landfill was stated to be around three to four times the cost of disposal at a fill operation. Pre-Filed Testimony of Claire A. Manning, Exh. # 51 at 2.

2. Response Costs for Groundwater Contamination

The value of preventing contamination is always difficult to quantify. Among other factors, it consists of costs avoided and resources preserved for current and future uses. The primary reason for requiring groundwater monitoring at fill operations is to identify any groundwater contamination at an early stage so corrective action can begin immediately such that off-site impacts will be prevented. The Board's decision entirely places its faith that groundwater contamination will be prevented in the imperfect front-end certification and screening procedures. It leaves no way of determining if that faith is justified short of discovery of contamination by other users of the aquifer. If groundwater contamination were to occur and remain undetected until discovered by other users of the groundwater, substantial delays in initiating corrective action already would have occurred and the costs of corrective action would increase with the delays.

Additional delays in initiating corrective action would occur because, instead of direct evidence of contamination provided in a timely manner by a groundwater monitoring system and triggering corrective action under the rules, authorities would be forced to conduct an expensive

investigation to identify the source of the contamination and to file an enforcement action to compel corrective action by the responsible party. It is possible that an investigation would be inconclusive as to the responsible party and that no enforcement action could be filed. In that case, all the costs of corrective action or its absence would be borne by the public through remedial actions, loss of the resource, or both. Based on new information provided below, it is reasonable to suggest that local governments, the Agency, the Office of the Attorney General, and the Board or courts could consume thousands of dollars in public resources in conducting investigations and in taking appropriate action to protect the public.

If a responsible party was identified and an enforcement case was successful in compelling corrective action, the responsible party would be required to address the source of the contamination. However, to the extent contamination in potable water supply wells caused the investigation, the response to protect the users of the wells would have to begin immediately and could not await the outcome of the investigation and enforcement action. In all likelihood, government agencies would identify the number and locations of the contaminated wells and provide safe, alternate water supplies as quickly as possible. Costs would have to be recovered to the extent possible at a later date again using the Board or the courts. In the initial proceeding, the Agency submitted examples of the costs that can be incurred for providing alternate water supplies. That information is summarized briefly here. Interested persons should refer to the Pre-Filed Testimony of Mr. Cobb, Exhibit 26 at 15 – 17 for the original discussion.

The Agency has substantial experience working with private well owners when groundwater contamination has migrated to commercial or residential properties relying on wells to provide potable and domestic water supplies. Once a small water system well is contaminated, the primary corrective action very well may be to connect well-users to a treated community water supply ("CWS") (*e.g.*, Wauconda, Downers Grove, Lisle, Soper Avenue,

Exelon Braidwood, McHenry). Advanced treatment processes to address chemical contaminants in groundwater are not feasible for private wells, and, in any case, equate to significant costs including operation and maintenance by a qualified person.

Extending water mains and paying for service line connections are expensive. For example, in the recent drinking water needs survey conducted for Aurora in Kane County, the cost per lineal foot of four inch water main is $266/foot. Under the project, the city was running 8,900 feet of water main at a cost of $2,370,000. Once the water main has been constructed, the homeowner still must pay for connection to the main by a water service line. The private drinking water system wells in Downers Grove (DuPage County) were contaminated by volatile organic compounds ("VOCs") from the Ellsworth Industrial Park, and the remedy was to connect the affected properties to a CWS. The estimated cost for running a service line from the water main to property line and valve vault (water service shut-off) was $1500 per home. The additional cost estimate from that point to the house was $2500 per home (including well abandonment/sealing, which was $1000 or less). In addition, connection to a treated CWS comes with monthly bills for service users that do not normally accompany private water systems.

A second example is Wauconda (Lake County) where private wells were contaminated with VOCs above detection levels but below numerical standards. The remedy was to connect the private water system owners to the Village of Wauconda's CWS. A 2005 cost estimate for copper service lines from the water main to homes was estimated to be $1,000; valve vaults cost $2,500; abandonment of the private drinking water system well was $1,000; and meters cost $600. Therefore, a cost estimate merely to run a service line from the water main to a typical home (based on 2002 – 2005 data associated with these two site-specific examples) ranges from $1,000 to $1,500 per home. However, the price range increases to $4,000 to $5,000 per home

(excluding the costs of running the water main to the property) when one includes the cost of running a service line to the home, the valve vault, water meter, and private well abandonment in accordance with applicable regulations (also intended to prevent contamination of groundwater resources). These costs are in addition to the unquantified costs of investigations, litigation, public notification and education, planning and organizing, monthly bills for alternate potable water supplies, diminished property values, and the partial or complete loss of the resource.

To illustrate the larger scale on which costs for groundwater contamination plumes can accumulate once governmental entities are called upon for response and remediation activities, the Agency has partial figures for some of the examples listed above. These figures were not presented in the initial docket. To the extent the sources for these incidents are known, they are not fill operations. They carried on industrial or commercial activities over varying periods of time using materials with much greater potential for contamination than the soil that will be placed in fill operations. Nonetheless, the following information provides useful perspective on the difficulties and costs faced by local, state and federal governments once they must respond to groundwater contamination incidents, especially those with well contamination. These costs represent public resources that may or may not be recoverable.

The Downers Grove response action required the connection of 860 well owners to the community water supply. Water mains were available in just in a small portion of the three unincorporated areas where the private wells were located. The Agency alone spent approximately $1 million between June 2001 and September 2002 in staff time, lab work, geoprobe investigation, and for work by contractors. The United States Environmental Protection Agency ("U.S. EPA") eventually stepped in because of the scale of the problem and its access to greater resources. At least twenty-two potentially responsible parties ("PRP") were identified. The U.S. EPA's Administrative Order document states $4.275 million was to be paid

by the PRPs to cover the local share of funding for infrastructure work. It is not clear whether or not this covered all the homeowners' costs for connection to the CWS. A cleanup of the groundwater resource has not yet occurred. The U.S. EPA likely will attempt to recover these cleanup costs from the PRPs as well.

The Soper Avenue site is in the northwest part of Rockford. It is partly incorporated and partly unincorporated. A remedy for the benzene groundwater contamination (as high as 98,000 parts per billion upgradient from homes; Class I groundwater quality standard: 5 parts per billion) is yet to be determined. There is a potential for vapor intrusion in the downgradient homes. If a removal action is conducted where the highest benzene concentrations were found in soil and groundwater, it would be very expensive. The Illinois EPA has put in 150 to 200 hours at an approximate average of $100 per hour for research and field work on the source investigation and public notifications including public meetings and fact sheet mailings. There also are laboratory costs for sample analysis. These activities are on-going, and costs continue to climb. Again, the U.S. EPA is involved, and a federal removal action is funded for $152,500 to provide bottled water and to perform the anticipated water connections.

The McHenry contaminants (*i.e.*, PCE, TCE, cis-1,2-DCE and vinyl chloride) are in two separate plumes on the east side of the City of McHenry. One PRP is identified for the south side plume; none for the north side. The McHenry County Health Department did most of the private well sampling – at least four rounds of sampling. The Illinois EPA estimates approximately $2,000 in costs to the County per round of sampling, including staff time costs as well as laboratory fees. The County would have additional costs for meetings and other activities. In addition, the Illinois EPA has been involved since 2007 with Geoprobe work, and many hours of reconnaissance and meetings with the City, PRPs and the Illinois Department of Health. The Illinois EPA collected data and put together maps and spreadsheets for a referral to

the Illinois Attorney General's Office. It also completed a right-to-know notification and sent out several fact sheets for 278 affected or potentially affected entities. The Agency estimates staff time related to the project at approximately 200-300 hours at an average of $100 per hour. The investigation is ongoing, and costs continue to climb. Now, the investigation has been referred to the U.S. EPA to take care of the northern half of the site. The Illinois EPA and the IDPH are working with U. S. EPA to arrange for more private well sampling so the U.S. EPA can decide on a remedy. This may require the connection of as many as thirty homes to the CWS. The U.S. EPA may include the south part of the site in the remedy, which likely would require CWS connections for all the homes in the area. This will involve perhaps another thirty homes or more. The City of McHenry's estimates for the homeowners' portion of the costs of connection to the CWS are $8,600 to $10,400 per home. In addition, the City of McHenry estimates costs for water main installation in two loops (on the north side and south side of Route 120) to be $412,886 for the north side and $278,000 for the area to the south (including engineering costs).

Groundwater contamination sites are some of the most expensive sites to remediate. It is nearly impossible to totally clean up the groundwater once it is contaminated. Governments are left with limited options. Source areas can be removed and/or treated, if they are still apparent. The groundwater can be treated at the point of withdrawal. And, it is possible to remove the exposure pathway by placing residents and businesses on a community water supply. However, with the current knowledge of the threat of vapor intrusion, even providing CWS connections may not be the final remedy.

Harm avoided is a benefit often unrecognized, unappreciated and undervalued. However, the Board historically has recognized the benefits of preventing groundwater contamination and preserving groundwater resources for their highest current and future uses. Once again, several

findings of the Flemal Report cited above are particularly relevant here: (1) Remediation of groundwater contamination is likely to be difficult and expensive if it can be accomplished at all; (2) the primary long-term measures for protecting groundwater resources are those that prevent contamination; (3) groundwater monitoring must be expanded. Unless the Board is certain that certification and screening requirements will perform so well that fill operations cannot cause groundwater contamination, it must consider in the long run that the value of preventing contamination may more than offset the costs of groundwater monitoring at fill operations and that the risks and the costs of prevention should be borne by those who benefit from the actions creating the potential for contamination. 415 ILCS 5/2(b) (2010).

III. GROUNDWATER MONITORING REQUIREMENTS PROPOSED BY THE AGENCY

A. Should Groundwater Monitoring Be Self-Implementing?

The self-implementing groundwater monitoring and corrective action requirements proposed by the Agency will be an effective final check providing the greatest assurance of any of the control measures that the material placed in fill operations will not adversely impact groundwater. However, the Agency also notes that several concerns about the Agency's proposed "Subpart G: Groundwater Monitoring" were expressed by other participants but were not fully aired during the proceeding. Once the Board determined in its First Notice Opinion that groundwater monitoring would not be included in Part 1100, the discussion shifted to whether or not there should be groundwater monitoring at all. There was little, if any, additional discussion of the details of the proposed groundwater monitoring/corrective action program.

The Agency notes the Board has adopted rules with similar self-implementing monitoring provisions that have effectively regulated various types of facilities without adverse impacts to the environment. For example, 35 Ill. Adm. Code 615 and 815 are existing regulations that include self-implementing groundwater monitoring requirements for certain types of existing

facilities or units located wholly or partially within groundwater setback zones or regulated recharge areas and for landfills exempt from permits under the Act. The Board expressed reservations about the self-implementing elements of the Agency's proposal, including groundwater monitoring. First Notice Opinion at 72 – 74. Its response was to strengthen recordkeeping and reporting requirements for the other self-implementing requirements. *Id.* Similar revisions might be appropriate for the Agency's Subpart G if the Board decides to reopen the issue of groundwater monitoring under Part 1100. However, the Agency still maintains that the over-all concept of self-implementation must be retained.

It is true that many programs requiring groundwater monitoring under the Act and implementing rules also require prior Agency review and approval of groundwater monitoring system plans and Agency oversight of construction activities. There is no doubt this provides greater certainty of compliance, but it is also resource intensive. An important reason for the use of a self-implementing groundwater monitoring requirement is the Agency's resource limitations. The Bureau of Land Permit Section already is significantly understaffed and has many backlogged projects. If the Agency were required to review and approve the plans and reports for all actions required under this proposed rule (*e.g.*, groundwater monitoring program, USFOs) as suggested by some participants, it would more than double the groundwater monitoring workload and require several additional technical staff to adequately review and administer. Increases in staffing are unlikely for the foreseeable future. However, for the following reasons, the absence of certain procedures for prior review and approval does not mean the Agency's self-implementing monitoring proposal is defective and cannot work.

First, while the Agency cannot agree that certification and screening procedures will be sufficiently effective to block all contaminants from entering fill operations, it also has acknowledged that these tools, along with the MACs, are two of the barriers on which it is relying to provide protection from contaminated soil in a self-implementing program. Threats to

human health and safety, environmental receptors, and groundwater at the fill operations are most likely to come from accepted loads of soil. With the possible exception of asphalt pavement, other clean construction or demolition debris as defined at Section 3.160(b) of the Act (*i.e.*, uncontaminated broken concrete without protruding metal bars, bricks, rock, stone) is less likely to be a source of environmental contamination. That is why it has been designated by law as "clean" construction or demolition debris. To address the potential for contaminated soil, the Agency has proposed and the Board has adopted conservative, health-based MACs. The Board also adopted enhanced certification and screening procedures that it believes are sufficient to ensure protection of groundwater. The Agency does not completely agree and has also advocated adoption of groundwater monitoring and corrective action requirements to provide further assurances.

Second, the Agency will rely on licensed professional engineers to supervise and affix their seals to the design and construction of the groundwater monitoring systems and the preparation of related programs, notifications, plans and reports. As a check on these activities, the Agency may, on a case-by-case basis, verify through site inspections and other means that fill site owner/operators with confirmed groundwater exceedences are complying with the groundwater corrective action to make sure the plan has been implemented and is effective.

Third, the Agency will rely on field inspections of the facilities to verify compliance with groundwater monitoring requirements. The Agency anticipates no less than two inspections at each facility annually, and, as resources allow, plans for quarterly compliance inspections. The inspection frequency for the permitted CCDD facilities and USFOs may vary depending on the volume of materials that is accepted, the compliance record demonstrated by the facility, and if complaints are reported to the Agency. It should be noted that some counties have been delegated inspection authority for these sites, and, typically, the inspection frequency by the

counties is much higher. If violations are noted, the Agency would issue a violation notice and require corrective action in response to the violation. Any activities taken to resolve the violation notice would be overseen by the Agency's Field Operations Section. This kind of corrective action is separate from corrective action associated with groundwater contamination. In such cases, the Agency could recommend additional groundwater monitoring and analysis that is supplemental to what was proposed in Subpart G and provides an additional safeguard to groundwater resources.

In this case, self-implementation is essential for the Agency's administration. While regulations requiring more direct Agency oversight of groundwater monitoring certainly are in use at many Illinois facilities, the self-implementing versions also are in use and have not been shown to be unreliable. As a result, the Agency continues to propose its Subpart G as an effective means of monitoring groundwater at fill operations and as a focal point for additional proceedings on the matter.

B. Design of Groundwater Monitoring Systems and Placement of Wells

As noted in Section III(A) immediately above, the Agency is aware the details of the Agency's proposed "Subpart G: Groundwater Monitoring" were not fully examined to the satisfaction of all participants because the issues of system design and operation became moot once the Board determined at First Notice that groundwater monitoring would not be included in Part 1100. Nonetheless, the Agency stands by its original Subpart G as amended in Agency errata sheets as the basis for groundwater monitoring at fill operations. The Agency understands that a decision by the Board to reopen the groundwater monitoring issue would require additional examination of, and possible revisions to, the proposed Subpart G.

C. Parameters to Be Monitored

In its proposed "Subpart G: Groundwater Monitoring," the Agency recommended

groundwater monitoring for all parameters for which 35 Ill. Adm. Code 620 establishes a Class I groundwater quality standard. As a result of the recent amendments to Part 620, 118 parameters now have Class I groundwater quality standards. *See* In the Matter of: Proposed Amendments to Groundwater Quality Standards (35 Ill. Adm. Code 620), PCB R2008-18, Final Opinion and Order (October 4, 2012). The reason for requiring monitoring for all of the Part 620 parameters is that soil accepted at fill operations could originate in voluminous amounts anywhere construction or demolition activities might take place – a very diverse set of origins. Pre-Filed Testimony of Stephen F. Nightingale, P.E., Exh. 1 at 24 – 25, 32. Under these circumstances, the Agency is reluctant to reduce the parameters for monitoring. The Agency's use of the Part 620 parameters is itself a form of indicator contaminant monitoring. There are many more contaminants that could find their way into fill operations than are included in the Part 620 Class I groundwater quality parameters.

Mr. Hock testified for the IAAP that the costs of analyzing samples for the entire Part 620 list of parameters (prior to the October 2012 amendments to Part 620) would be approximately $3000. Pre-Filed Testimony of Mr. Hock, Exh. 12 at 6; Testimony of Mr. Hock , Tr. 2 at 33 – 34. Mr. Hock testified that the cost of analyzing for the four radionuclides (radium-226, radium-228, tritium, strontium-90) alone would be approximately $800 – over one-fourth of the total cost of analysis for each sample. *Id.* The analyses for another grouping of eight constituents (mostly pesticides) would cost approximately $600 because separate analytical methodologies would be required. *Id.*

The Agency subsequently submitted Errata Sheet Number 3 (filed November 21, 2011) in which it proposed to amend proposed Section 1100.735 by excluding the four radionuclides from the monitoring requirements as well as eight explosives that were pending in the Part 620

amendments in PCB R2008-18.[7] In addition, the Agency proposed an Appendix A to Part 1100 that would list these twelve parameters as excluded from the routine groundwater monitoring analytical requirements. The Agency agreed that the likelihood of finding the radionuclides or the explosives in monitoring wells at fill sites was very low, and their removal from the list would result in significant cost savings for the annual groundwater analysis requirement. Costs of analysis for the Part 620 parameters are now estimated at approximately $2000 per sample (prior to the October 2012 amendments) with one sample per monitoring well required annually. Agency's First Notice Comments, PC # 39 at Attachment 5. However, removing these contaminants from the Subpart G sampling parameters does not mean they are not considered contaminants for purposes of Subpart F. The presence of any of these contaminants in soils delivered to fill operations still must comply with the applicable MACs, whether listed in the MAC Table or calculated pursuant to Section 1100.605(c). Their presence in excess of the MACs would preclude acceptance of the soils at fill sites. The Agency did not agree that the pesticides mentioned by Mr. Hock should be excluded from the monitored parameters because they are believed to be more common in the environment than the radionuclides and explosives.

On the issue of indicator contaminants, Mr. Hock's testimony for the IAAP stated groundwater monitoring should not be required for CCDC facilities. Pre-Filed Testimony of Mr. Hock, Exh. 12 at 5; Testimony of Mr. Hock, Tr. 2 at 33. However, if groundwater monitoring were required by the Board, it should be based on what is in the source material – a site-specific indicator contaminant concept that also would likely reduce the number of parameters required to be monitored. Testimony of Mr. Hock, Tr. 2 at 33 – 34, 41 – 42; *see also* "Comments by Michael Rapps on Behalf of Iron Hustler Excavating, Inc.," PC # 19 at 6 - 7. Based on sampling and analysis at four CCDD fill sites performed or reviewed by his company, Mr. Hock

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[7] The eight explosives were adopted as Part 620 parameters in PCB R2008-18 on October 4, 2012.

recommended "a fairly complete list of metals and a typical list of PNAs. It's about 20, 25 compounds." Testimony of Mr. Hock, Tr. 2 at 41 – 42. Also based on the sampling at the four sites, Mr. Hock did not believe other categories of contaminants (*e.g.*, radionuclides, volatile organic compounds, semi-volatile compounds, pesticides) are of sufficient concern to justify groundwater monitoring. However, other parameters could be added to a facility's monitoring requirements if the site's historic records or enforcement history indicated additional contaminants of concern. *Id.* at 32 – 35, 41 – 42.

Mr. Hock was pressed by Mr. Clay of the Agency, Mr. Wilt of WMI and Mr. Sylvester of the Attorney General's Office to elaborate on how other site-specific contaminants of concern would be identified and incorporated into a site's groundwater monitoring requirements such that the public is protected by indicator contaminant groundwater monitoring. *Id.* at 41 – 42, 54 – 57, 61 – 64. Mr. Hock suggested that facility records could be reviewed to determine if a fill site had accepted large volumes of material from a particular source or sources that had particular contaminants that needed to be segregated or were close to the MACs. These contaminants could be added to the list. *Id.* at 41 – 42. Additional parameters could be identified from a site's enforcement history.

The concepts for a limited approach to groundwater monitoring offered by Mr. Hock for the IAAP would require considerably more discussion and development before they could offer the level of protection for groundwater and the public the Agency believes is necessary. There are at least three concerns, and others may arise upon further consideration. First, Mr. Hock's approach would rule out certain categories of contaminants unless they are known to exist at the facility. The Agency believes a true indicator contaminant approach would not rule out any categories of contaminants from groundwater monitoring but would include representative contaminants from all major categories of contaminants for regular monitoring. Given the

potential consequences of failures to detect, ruling out entire categories of contaminants based on data from four fill operations – a mere snapshot in time at a small sample of facilities – would not be acceptable to the Agency. If ruling out categories could be accomplished at all, it would require a much more systematic study of the contents of fill operations over time.

Second, Mr. Hock's suggestion of monitoring only for site-specific contaminants based on site records and enforcement history is retrospective only. For reasons stated in Section II(A) above, the Agency's position is that the chances for soil with contaminants exceeding the MACs to be accepted at fill operations are never completely eliminated. Therefore, the groundwater monitoring must be both retrospective and prospective with the capacity to detect contaminants from materials already within the fill operations and to anticipate those that might be accepted in the future. Mr. Hock concludes from limited data that the story of contaminants in fill operations already is written. The ending is that there is no need for comprehensive groundwater monitoring, and limited groundwater monitoring is necessary only if facilities are known to have taken materials of a questionable nature or in direct violation of the rules. The Agency views the story as ongoing and far more dynamic because the locations where soil from construction or demolition activities may be generated are virtually unlimited, and any of a number of contaminants might be present depending on current and historic activities at and adjacent to these source sites. Even at well-run facilities, certification and screening procedures and Agency inspections cannot guarantee contaminants will not be accepted or, if they are accepted, that they later will be identified and removed before creating problems. Thus, day-to-day circumstances at fill operations can change, and only a more comprehensive monitoring plan will cast a net broadly enough to provide an early warning of groundwater contamination.

Third, the limited approach would not work well unless additional administrative procedures are created in support of the approach. If monitoring is required only for site-specific

contaminants based on site records and enforcement history, then some sort of administrative mechanism for periodic in-depth evaluations of facility records and making final determinations on monitoring parameters would be required. Standards and criteria for triggering groundwater monitoring and identifying contaminants of concern would be necessary along with mechanisms for revisions to monitoring plans and appeal procedures. Many questions are unanswered. What sorts of site records would be needed and how specific would the information need to be to identify additional parameters and justify the imposition of a groundwater monitoring requirement? How many and what kinds of enforcement actions would be required for the same purpose? Would administrative citations be sufficient or would adjudicated violations with Board or court orders be required? Answers to these questions and more would have to be addressed in the rules. One can easily imagine the administrative burdens of this approach would, in the end, be more time-consuming and costly than any savings realized from using a limited, site-specific, retrospective approach to reduce the number of monitoring parameters from those in the Part 620 Class I standards.

In fact, the Agency's proposed "Subpart G: Groundwater Monitoring" resolves each of these concerns. The Agency's proposal is substantially more comprehensive because the Part 620 parameters include the major categories of contaminants such as metals and other inorganics, VOCs, SVOCs, PNAs, and pesticides. Because the Part 620 parameter list is more comprehensive, it is both retrospective and prospective in its reach – it can identify contaminants from historic activities as well as from changing circumstances without the need for additional administrative procedures, standards and criteria. Considering the advantages of a comprehensive approach to groundwater monitoring, and, in the absence of a viable plan for reducing monitoring parameters, the Agency's use of Part 620 Class I parameters should be adopted as the basis for the groundwater monitoring requirement.

IV. COMMENT ON SECTION 1100.600(d)(2)

At Second Notice, the Board's discussion of the soil pH issue and its impact on contaminant mobility noted that Mr. Huff and Dr. Roy "stated that the rules must allow source site owners/operators to amend soils with low pH with limestone to increase soil pH." Second Notice Opinion at 78 – 79. The Board agreed, stating:

> The Board agrees with IEPA that soils rejected solely on the basis of pH being outside the range should not be considered waste. However, since the Board is proposing to establish MACs based on a soil pH range of 6.25 to 9.0, acceptance of soils with a pH value outside the proposed range would not assure groundwater protection. Therefore, one viable option for soils from non-PIP sites or soils from PIP sites meeting the applicable MACs with pH below 6.25 would be to treat or amend the soil with limestone to increase the pH, as suggested by Mr. Huff and Dr. Roy. The Board believes there is nothing in the proposed rules that would prohibit an owner/operator to amend the soil with limestone to increase the soil pH prior to sending the soil to a fill site.

Id. at 79.

The Agency believes subsection 1100.600(d)(2) prohibits this practice by excluding from Subpart F applicability "soil that has at any time been treated or diluted to reduce contaminant concentrations or mobility (*e.g.*, treatment to reduce extraction test contaminant concentrations) . . ." The reason soil pH was an issue in this proceeding is precisely because it affects contaminant mobility and therefore the applicable MACs for certain pH-sensitive contaminants. The Agency included this provision in its proposed rule because it is aware that soil is sometimes treated in situ or ex situ to alter pH so that extraction test concentrations are reduced. This practice can affect the legal requirements for managing the soil without actually reducing the concentrations in the soil. SOR at 22 – 23; Pre-Filed Testimony of Mr. Clay, Exhibit 3 at 3. The Board suggests the practice would be allowed only after the soil has been determined to meet the applicable MACs, which the Agency understands to mean that sampling and analysis must have been completed and compliance with the applicable MACs confirmed before the soil could be amended to alter pH.

As a general matter, the Agency does not accept this type of manipulation in the Board's waste management and remediation programs. It could accept the amendment of the soil to alter only pH if, as the Board suggests, it is performed only after compliance with applicable MACs has been confirmed. However, three concerns must be noted. This restriction is probably meaningless in the source-site owner/operator context where sampling and analysis are not required, there probably is no way to police this restriction in the context of either certification procedure, and the addition of the lime could in fact alter an otherwise unacceptable concentration of a pH-sensitive contaminant to achieve the applicable MAC by artificially raising the pH. Further, the Agency believes it is obligated to enforce Section 1100.600(d)(2) as written. The Agency requests that the Board revisit this issue and revise its opinion for consistency with Section 1100.600(d)(2) as written, or, in the alternative, eliminate the conflict by creating a specific exception in subsection 1100.600(d)(2) for the practice of adding lime after confirmation of compliance.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

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DATE: December 3, 2012

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COUNTY OF SANGAMON)

PROOF OF SERVICE

I, the undersigned, on oath state that I have served the attached the Illinois Environmental Protection Agency's Comments on Groundwater Monitoring, upon the persons to whom they are directed by placing copies of each in an envelope addressed to:

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and sending or mailing them, as applicable, from Springfield, Illinois on December 3, 2012, with sufficient postage affixed as indicated above.

Mark Wight

SUBSCRIBED AND SWORN TO BEFORE ME

This 3 day of December, 2012.

Cynthia L. Wolfe
Notary Public

OFFICIAL SEAL
CYNTHIA L. WOLFE
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 11-17-2015

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