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April 17, 2017

Mr. Michael W. Smith, PE
Iowa Department of Natural Resources
502 E. 9th Street
Des Moines, IA, 50319

Subject: Response to IDNR Draft Document on Requests to Reduce or End
Post-Closure Care and Preparation of Post-Closure Care
Reduction/Termination Plans

Dear Mr. Smith,

On behalf of the Iowa Society of Solid Waste Operations (ISOSWO), this letter has been composed in response to the Iowa Department of Natural Resources (IDNR) draft recommendation document related to requests to reduce or end post closure care (PCC) and preparation of PCC reduction/termination plans, originally prepared in February 2016 (IDNR Document).

In preparation of this letter, comments and questions were solicited from a broad group of representatives within the Iowa solid waste community, including public agencies (large and small), private landfill owners/operators, and engineering consultants. Furthermore, the ISOSWO Technical Advisory Committee convened meetings on multiple occasions to discuss specific components of the IDNR Document, evaluate comments and questions submitted by the Iowa solid waste community, and to provide direction on development of this response letter.

Collectively, we recognize the termination and reduction of PCC obligations is an issue of significant importance for Iowa communities and landfill facilities related to both financial wellbeing and overall quality of the environment. ISOSWO appreciates IDNR initiating action on this topic and undertaking the initial effort to gain clarity on how Iowa landfill facilities may initiate this PCC reduction or termination process. We further appreciate IDNR engaging the industry in this important dialogue prior to moving forward with a final guidance document or rulemaking effort.

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The approach for terminating PCC proposed by IDNR focuses on the objective of complete organic stability (“equilibrium”) of the waste mass, with a series of target goals similar to those established by the Kansas Department of Health and the Environment (KDHE) defining when the primary components of the landfill system (leachate, groundwater, gas, final cover) reach the point of equilibrium. While there are specific aspects and procedural elements proposed in the IDNR Document we agree with, we do not agree with the fundamental underlying basis of using organic stability as the determining factor for termination of PCC.

Throughout the IDNR Document, the statement “trend analysis demonstrates equilibrium” is used, however “equilibrium” itself is not defined. Even if it were, evidence suggests such a condition may not be present within a closed landfill facility within the next century or more, and, more generally is a purely theoretical condition in the dynamic system of our natural world. The IDNR Document suggests measurement of “equilibrium” of landfill gas, leachate, cover, groundwater, and settlement, although the utility or validity of the targets which would qualify a given data set as reaching equilibrium is not clear. We note that the same heterogeneous nature of municipal solid waste which creates challenges for operation of active facilities also creates the potential for a widely inconsistent waste profile within a closed facility. This leads to a reasonable conclusion that organic stability will be difficult to measure or achieve with consistency in the entire waste mass, and therefore may not be practical as a determinant for cessation of active PCC obligations.

Of additional concern, the target goals for organic stability outlined by the KDHE guidance have not been measured or observed on a field-scale in an actual closed landfill environment. These data targets have been selected without the context of whether such targets are achievable or even measurable in practical application, and also without a cost-benefit analysis typically required in advance of state rulemaking or guidance. Without peer-reviewed data to support the underlying assumptions, such targets would not be suitable to base the decision for terminating PCC.

In recent years, the prevailing approach of the industry at large (including regulators, owners, operators, engineers, and leading industry stakeholder organizations) to addressing PCC termination requirements has, with broad support, aligned with a risk-based “functional stability” model. This approach centers around the goal of documenting the protection of human health and the environment on a system-wide basis using predictive models and site-specific data to facilitate the beneficial reuse of property and termination of capital-intensive active monitoring and controls. The result is a defensible performance-based outcome in consideration of potential receptors at a designated point of exposure in the absence of active control systems. This risk-based functional stability model is the approach to PCC termination and reduction advocated by ISOSWO.

The latest guidance on the subject from EPA was released in December 2016 (*Guidelines for Evaluating the Post-Closure Care Period for Hazardous Waste Disposal Facilities under Subtitle C of RCRA*). This guidance supports a performance-based determination process where the PCC period can be longer or shorter than 30 years based on

evaluation of the potential for a release to reach a receptor via a reasonable exposure pathway (or point of exposure). The guidance does not provide specific performance standards for the waste mass, rather, the owner/operator is directed to make “a determination that site-specific conditions adequately minimize the risk to the human health and the environment.” The EPA document also supports modular optimization (or step-down) of control system operation and monitoring frequency, and that transition to a long-term stewardship period (from traditional PCC) is the goal, with institutional controls cited as a priority means to transition away from the PCC permit process. This framework is consistent with the functional stability approach endorsed by multiple state solid waste regulatory agencies (see below) and herein by ISOSWO.

ISOSWO’s support of a functional stability approach to PCC termination is further supported by existing Iowa code, which speaks to the underlying objective of a risk-based model conceived by the Iowa legislature. As also referenced in the IDNR Document, Iowa Code Chapter 455B.301”c”(15) defines the period of post-closure care as the time required for maintenance and monitoring of a sanitary disposal project after closure that will (emphasis added) “prevent, mitigate, or minimize the threat to public health, safety, and welfare and the threat to the environment posed by the closed facility.” Similarly, 567 IAC 113.4(8)”b” states (emphasis added), “If the department finds that an MSWLF has completed all required post-closure activities and no longer presents a significant risk to human health or the environment, then the department shall issue written notification that a closure permit is no longer required for the facility.” In both cases, we interpret existing state code as directing IDNR to utilize a risk-based approach to terminating PCC.

In evaluating the validity of utilizing a risk-based approach for termination or reduction of PCC, we encourage IDNR to leverage the research and procedural models developed by industry organizations and other state regulatory agencies. Specifically, the following peer-reviewed and data-based documents were used in developing the basis for this response letter, and provide a thorough evaluation of the risk-based functional stability approach to terminating PCC requirements for which ISOSWO is advocating:

State Guidance

FDEP Guidance Document SWM-04.45, LTC at Solid Waste Disposal Facilities.
Florida Department of Environmental Protection. February 20, 2016.

End of Post-Closure Care for Solid Waste Sites and Facilities, Colorado
Hazardous Materials & Waste Management Division, Dept. of Public Health &
Environment, July 2016.

Case-Studies and Technical Research

Implementation of the EPCC Methodology for Assessment of Functional Stability,
Mohawk Valley Landfill, Frankfort, New York, Environmental Research and
Education Foundation, April 28, 2016.



Functional Stability and Completion of Post-Closure Care at Municipal Landfills: Findings from Application of a Performance-Based Methodology. Morris, J, Caldwell, M, Bull, L, Crest, M, and Akerman, A. Proceedings of the Fourteenth International Waste Management and Landfill Symposium, Cagliari, Italy, 30 September-4 October 2013.

Determining Critical Data Requirements for Implementation of the EPCC Methodology Prerequisites Module: A Multi-Site Case Study. Environmental Research and Education Foundation, March 18, 2011.

Performance-Based System for Post-Closure Care at Municipal Solid Waste Landfills: a Procedure for Providing Long-Term Stewardship Under RCRA Subtitle D. Environmental Research and Education Foundation, September 2006.

Evaluating, Optimizing, or Ending Post-Closure Care at Municipal Solid Waste Landfills Based on Site-Specific Data Evaluations. Alternative Technologies Team, Interstate Technology & Regulatory Council, September 2006.

As a whole, ISOSWO and the collective resources listed above agree with IDNR that in order for PCC requirements to be terminated or reduced, the four main landfill system components ("modules") of (1) leachate management, (2) gas controls, (3) groundwater monitoring, and (4) final cover maintenance must be appropriately addressed. We further agree that, similar to the revised PPC Plan recommended in the IDNR Document, an evaluation of the proposed end-use strategies of the landfill must be integrated into the facility's long-term care obligations, as must identification of the specific data requirements and threshold criteria to be used to evaluate the four main PCC components as part of the decision to move to less stringent levels of care. Finally, we also agree that any successful approach must stress proactive data collection starting as soon as is reasonably possible (including during the active life of a facility).

With the threshold criteria set for each of the four key landfill system components, the risk-based approach proposed by ISOSWO allows data evaluation at a defined point of exposure based on whether the facility no longer poses an unacceptable threat to human health or the environment at that defined point in the absence of active controls. Under this approach, once a closed landfill has achieved an acceptable level of risk-adjusted stability ("functional stability"), the regulatory PCC period is complete and the facility may be moved into non-regulatory custodial care or similar future status (i.e., EPA's long-term stewardship phase).

Even after (and if) IDNR decides to pursue a risk-based approach for terminating PCC, numerous details remain to define a practicable solution for each facility that is protective of both human health and the environment and the financial resources of Iowa citizens. We recognize this is a major undertaking, and welcome the opportunity to continue



working with IDNR as a partner and sounding board for the continued evaluation of PCC termination or reduction program details and development of regulatory guidance.

We appreciate IDNR's willingness to engage in meaningful dialogue on the best approach for resolving this complex issue of termination or reduction of post-closure care requirements at Iowa landfill facilities. If you have any questions regarding the recommendations or information provided in this letter, please do not hesitate to contact me at michael.classen@hdrinc.com or 402-926-7003.

Sincerely,

A handwritten signature in blue ink, appearing to read "Mike Classen".

Mike Classen, P.E.

ISOSWO Technical Advisory Committee Chairman

cc: ISOSWO Board of Directors
Amie Davidson, P.E., IDNR Solid Waste Section Supervisor