DICKINSON COUNTY LANDFILL ENVIRONMENTAL REVIEW

and

DOON DERAILMENT WASTE DISPOSAL

DICKINSON COUNTY BOARD OF SUPERVISORS

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REPORT TO COUNTY BOARD OF SUPERVISORS CONCERNING DICKINSON LANDFILL, INC., SPIRIT LAKE, IOWA

1.0 INTRODUCTION

On June 22, 2018, a Burlington Northern Santa Fe (BNSF) freight train derailed, resulting in 31 overturned tanker cars near the town of Doon in Lyon County, Iowa. Approximately 160,000 gallons of Canadian crude oil were released into flood-stage waters of the Rock River. Crude oil spread onto agricultural land adjoining the Rock River. As the initial incident response was being formulated, BNSF requested permission to transport certain non-hazardous waste streams containing several petroleum-impacted materials including soil, vegetation, and debris from the derailment site to the Dickinson Landfill, Inc. facility (Dickinson Landfill) in Spirit Lake, Iowa. The Northwest Iowa Area Solid Waste Agency granted permission to allow the petroleum contaminated waste to leave the Northwest Iowa Area Solid Waste Comprehensive Planning Area on July 2, 2018 and the Iowa Department of Natural Resources (IDNR), Land Quality Bureau gave their approval for disposal at the Dickinson Landfill on July 3, 2018 (Oldenkamp pers. com. 2018; Moon pers. com. 2018, respectively). Upon learning of the plans to bring these petroleum-impacted waste streams to the Dickinson Landfill, the Dickinson County Board of Supervisors (Board) became concerned about the potential environmental impacts that could be caused by placing large quantities of these waste streams into the Dickinson Landfill. Coggin & Fairchild Environmental Consultants (C&F) was retained by the Board to review information about the waste streams entering the landfill from the Doon derailment along with documentation pertaining to the operation of the landfill such as its pollution control methods, monitoring and reporting requirements, and emergency response planning. The Dickinson Landfill is owned and operated by Waste Management Inc. and is located at 2575 190th Street in Spirit Lake, Iowa. The landfill location is shown on Figure 1. According to a Dickinson Landfill representative, there is an estimated 40 years of waste disposal capacity remaining at the facility (Fairchild pers. com. 2018). The landfill layout, shown on a copy of a map obtained from a Dickinson Landfill report previously submitted to DNR, is provided in Appendix A. The existing and future phases of landfill development are also shown on the map provided in Appendix A.

This report presents findings from the examination of these matters including review of numerous documents such as correspondence, permit applications, environmental reports, laboratory reports, applicable regulations, and work plans. This investigation is limited, but is adequate to establish a reasonable understanding of the potential environmental concerns associated with placement of the subject waste streams into this landfill.

2.0 ENVIRONMENTAL SETTING

The Dickinson Landfill is situated within a well-known and highly prized area of natural beauty and ecological diversity associated with pothole wetlands and prairie uplands terrain. Glacial deposits from the most recent glaciation by the Des Moines Lobe are responsible for the hummocky topography characteristic of the area. Surficial geologic materials immediately surrounding the site are depicted as till ridge deposits of the Dow Formation on the lowa Geologic Survey's Open-File Map 04-02 (Quade et al 2004). The uppermost geologic materials with a thickness of 9 to 15 meters are described as variable in texture (grain size) with intervals of stratified loam or silt loam along with stratified sand and gravel, and unsorted or poorly sorted deposits of variable grain sizes within a generally silt and clay matrix (diamicton) (Quade et al 2004). The underlying glacial deposits within the Dow Formation can extend to a depth of 25 meters and are described as a massive, dense loam diamicton. According to maps presented on Sheet 1 of Miscellaneous Map Series 11 published by the Iowa Geological Survey (IGS) and the Iowa Water Survey (IWS), additional glacial deposits extend to depths of approximately 200 to 300 feet in the area near the lowa Great Lakes (IGS and IWS 2009). A relatively shallow water table occurs within the uppermost glacial deposits and therefore interaction of the shallow groundwater flow system with surface water resources (lakes and streams) and with wetlands is expected. Based on groundwater monitoring conducted by Dickinson Landfill, the water table is encountered at depths ranging from approximately 5 to 20 ft depending on location and recent climatic conditions (Liesch 2009). Water production capacity from these glacial sediments is generally limited but adequate for private residential water-supply wells. The uppermost bedrock is comprised of Cretaceous Age sedimentary rocks of the Dakota Formation that can reach a maximum thickness of approximately 500 ft in western lowa. Sandstone strata present primarily within the lower portion of the Dakota Formation comprise the Lower Dakota Aguifer, an important regional aguifer in western lowa. Review of the information about the

geology of the Lower Dakota Aquifer shown on Sheet 1 of Miscellaneous Map Series 11 indicates that the Lower Dakota Aquifer is approximately 100 to 150 ft thick near the Dickinson Landfill. The Lower Dakota Aquifer is capable of providing rural, industrial, and public water supplies in western Iowa. A search of publicly available water supply well records was conducted by Environmental Data Resources, Inc. (EDR) of Shelton, Connecticut on behalf of C&F to identify water-supply wells located within a one-mile radius of the Property. Selected pages from the EDR GeoCheck® Report pertaining to the water-supply well records indicate that no water-supply wells are located within a one quarter of a mile radius around the Dickinson Landfill (EDR 2018). According to the EDR report, several water-supply wells are located at greater distances within the 1-mile maximum search radius. These appear to be used primarily for private residential water supply and, in one or two cases, for irrigation.

Surface drainage is poorly developed in the geologically young glacial terrain resulting in the isolated wetland areas and kettle or pothole lakes and ponds. However, there is a surface water connection from the Dickinson Landfill area to Lower Gar Lake via wetlands, Bull Ditch and Milford Creek. The outlet into Lower Gar Lake is approximately 2.2 miles downstream from the Dickinson Landfill facility. The watershed containing the Dickinson Landfill (Milford Creek) overlaps with other natural resource management areas such as the Spring Run Grasslands Bird Conservation Area (BCA) that encompasses approximately 14,000 acres in Dickinson County east of Okoboji Lake. The U.S. Fish and Wildlife Service has also designated a 4,000 acre complex of both state and federally owned land within this BCA as the Spring Run Wetlands Complex, the second largest Waterfowl Production Area in the state. It is recognized that the Spring Run Wetlands Complex provides important watershed protection to Lower Gar Lake as well as critical wildlife habitat. C&F used the U.S. Environmental Protection Agency's WATERS GeoViewer website (https://www.epa.gov/waterdata/watersgeoviewer) to create a watershed map for the portion of the Milford Creek watershed immediately surrounding the Dickinson Landfill as shown on the diagram presented in Appendix C.

3.0 WASTE CHARACTERIZATION AND WASTE ACCEPTANCE

The Board requested a review of the waste characterization and waste acceptance process utilized by BNSF, IDNR, and Waste Management for the waste streams delivered to the Dickinson Landfill including the associated timelines. This topic was among those discussed at the August 27, 2018 Joint Informational Meeting between DNR, Waste Management, BNSF, the Dickinson County Board of Supervisors, and the public (Joint Informational Meeting). During that meeting, BNSF and IDNR representatives described the waste characterization and waste acceptance process as indicated by the following quotes from the minutes of the Joint Informational Meeting:

"One of the questions they've heard is will BNSF complete additional analytical on future waste for disposal, he thinks there is a little misunderstanding about how sampling takes place. They clean up a lot of sites, they do not just take one sample, you take a sample from a pile, you take multiple samples, you composite them together, and that gets you an analytical result, and that what we use for the profiling. When we dispose of the soil, since there could be a little bit more variability or heterogeneity with regards to the disposal of soils, they'll conduct additional soils sampling as needed. Somewhere around the every 500 to 1000 cubic yards they'll pull a sample to ensure that it is consistent their initial profile and the material that is being disposed of in the landfill." (Allan Stegman, BNSF - Joint Information Meeting Minutes 8/27/2018).

"Alex Moon (IDNR) said as Stegman mentioned there is ongoing testing so their approval that they gave in the permit specifies that the material cannot be hazardous and cannot contain liquids. So it's an ongoing testing, they would not just look at one test and say that it's safe to go. Its ongoing testing. So to answer your question, yes when we approve a material other than household garbage to be included in a permit they would specify that this material needs to be nonhazardous, it can't contain liquids and that's on the waste generator and the landfill to ensure throughout the process that it doesn't occur." (Joint Informational Meeting Minutes 8/27/2018)

In response to an October 5, 2018 request for information from C&F, BNSF transmitted a package on November 1, 2018 containing a flash drive with digital copies of certain documents. As requested, BNSF provided a copy of a waste sampling and analysis plan being utilized to classify waste streams derived from the Doon derailment site. The referenced document, prepared by one of their environmental consultants, is entitled "Standard Operating Procedures for Onsite Waste Management and Sampling, BNSF Doon, Iowa" (SOPs for OWM&S) (Arcadis, undated). It is interesting that the Arcadis document is undated. There is currently no documentation to indicate that the document was reviewed and

approved by any regulatory agency or by Waste Management. The document describes itself in Section 1 by stating "This document is a summary of instructions provided during daily project management calls and project related communications." Consequently, it is unclear what procedures the onsite staff at Doon were using initially and how those may have evolved as the work progressed.

In addition to the above, C&F obtained a substantial quantity of other documentation during the course of the investigation to assess whether the actual waste characterization and waste acceptance process was consistent with the descriptions provided at the Joint Informational Meeting and by the SOPs for OWM&S. Comments on whether the actual process was scientifically reasonable and adequate to assess the potential for future impacts by landfilling these waste streams at the Dickinson Landfill are presented later in this report.

BNSF provided a copy of a data table summarizing weekly waste disposal activity for the period from July 9, 2018 through January 18, 2019 including the total number of truck loads and the total tons of waste transported from the Doon spill site for disposal at Dickinson Landfill facility. Review of the Weekly Waste Disposal Summary Table presented in Appendix D reveals that it contains information about four waste streams that had been delivered to Dickinson Landfill for disposal as of October 31, 2018. As indicated by the Weekly Waste Disposal Summary Table, a fifth waste stream, Crude Bottoms, was not approved for disposal until November 27, 2018. The five non-hazardous waste streams of petroleum-contaminated materials and their assigned waste profile numbers that have been delivered to the Dickinson Landfill are as follows:

- Soil impacted with crude oil (102877IA);
- Vegetation impacted with crude oil (wood chips and corn) (102875IA);
- Vegetation and soil impacted with crude oil (102869IA);
- Absorbents and oily debris (includes rail car jackets) (102870IA); and
- Crude Bottoms (102924IA).

Based on the most recent data available to C&F from the Weekly Waste Disposal Summary Table that reflects activity through January 18, 2019, the total quantity of Doon derailmentderived waste delivered to the Dickinson Landfill facility is 20,448.71 tons. In comparison, the total quantity of waste received at the Dickinson Landfill facility in all of 2016 or 2017 was 40,195 tons and 31,124 tons, respectively (Municipal Waste Sanitary Landfill Financial Assurance Annual Report for 2017 and 2018a, Barker Lemar Engineering Consultants Kevin Jensen and Brian L. Rath P.E. 3/27/2017; 3/29/2018, respectively). Given these quantities, it is apparent that the Doon derailment-derived waste represents a significant percentage of the total annual quantity of waste received at the landfill. In fact, the Doon derailment-derived waste represents approximately 50.9 and 65.7 percent, respectively, of the 2016 and 2017 total annual quantities of waste received for disposal.

Waste sampling was completed for landfill waste acceptance purposes. Information from generator knowledge and laboratory analytical data from analysis of waste samples were submitted to Waste Management Inc. to obtain approval for disposal and to set up a waste Analytical parameters required for waste characterization are specified by the profile. landfill to demonstrate that the material does not meet the definition of hazardous waste and is suitable for disposal at this municipal solid waste landfill. A summary of the waste characterization efforts completed by BNSF to obtain approval for disposal at the Dickinson Landfill is provided in Table 1. Information about the quantity each waste stream delivered for disposal to the Dickinson Landfill is incorporated into Table 1 from the previously mentioned Weekly Waste Disposal Summary Table (Appendix B). In addition, Table 1 lists the number of waste samples, sample collection dates, laboratory analytical parameters, waste profile approval date, and a few brief highlights about the laboratory results. Finally, the ratio of truck loads to the number of samples per waste stream is presented in Table 1 along with the ratio of the tons of waste delivered for disposal to the number of samples per waste stream.

Four potential concerns have been identified about the waste characterization performed for Doon derailment-derived waste shipped to the Dickinson Landfill as follows:

- 1. The timeline of waste profile approval and the initiation of disposal at the Dickinson Landfill;
- 2. The numbers and timing of waste samples collected and analyzed to demonstrate representative waste characteristics;
- 3. The chemical analytical parameters selected to determine the waste characteristics; and
- 4. The sample collection procedures used in connection with waste sampling.

Details about each of the four concerns are presented and discussed in the following four report sections.

3.1 No. 1: Timeline of Waste Profiling and Disposal

The available timeline information compiled from the Weekly Waste Disposal Summary Table (Appendix B) and the waste profile documentation (See Table 1) indicate that the initial waste profile approvals were obtained before the Dickinson Landfill received the first load of waste for three of the five waste streams. The start of the earliest week for disposal of Vegetation Impacted with Crude Oil (102875IA), and for Crude Bottoms (102924IA) are both one day before the respective waste profile approval dates. Additional information is needed to clarify the date of delivery for the initial loads of these two waste streams.

Laboratory analytical results for total metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) were added to the Soil Impacted with Crude Oil waste stream profile approximately three weeks after the first loads were delivered to the landfill (Appendix B and Table 1). A single sample of Soil Impacted with Crude Oil waste had been analyzed for total metals. No explanation for amending the waste profile is provided in the waste profile amendment form submitted by BNSF on August 14, 2018. Thirty-nine loads of waste totaling approximately 595 tons had been delivered to the landfill by August 14, 2018.

3.2 No. 2: Numbers of Samples and Sampling Dates

As indicated in Table 1, relatively few samples were collected and analyzed for the waste stream representing 85.9 percent of the waste delivered for disposal, Soil Impacted with Crude Oil. The ratio of samples to the number of tons of Soil Impacted with Crude Oil appears to be far less than described by BNSF representative at the Joint Informational Meeting. The collection of samples for characterization of Soil Impacted with Crude Oil was limited to one date early in the cleanup process and is inconsistent with the description of the waste characterization process provided by BNSF and DNR representatives at the Joint Informational Informational Meeting. Obtaining samples that are representative of the waste stream would mean that the samples are collected periodically, during the time period that the waste is being generated, or periodically, as the waste is being gradually removed as in the case of a

large stockpile of waste that had been amassed from a cleanup effort that was completed. The SOPs for OWM&S prepared for BNSF states that limiting collection of waste characterization samples to the initial stage of cleanup is satisfactory by claiming that COC concentrations are highest during the initial phase of response activity (Arcadis undated). Arcadis reportedly relied on communication with its field staff to conclude that the waste characteristics remained consistent during the cleanup project (OWM&S, Section 9 Sampling and Analysis) (Arcadis undated).

The above-mentioned waste characterization practices are not necessarily a violation of federal or state solid waste regulations based on C&F's limited review of relevant regulations. However, they are not adequate to scientifically document the potential variability in waste characteristics and thus assess potential risks of disposal at the Dickinson Landfill. As far as we are aware, neither the landfill operator nor DNR gave local government officials an update to explain how waste characterization was being done differently than that described during the Joint Informational Meeting.

3.3 No. 3: Chemical Analytical Parameters

Review of Table 1 indicates that half of the waste characterization testing, for the carbonbased compounds (organic compounds) found in crude oil, consisted of determining concentrations of volatile petroleum hydrocarbons by Iowa DNR Method OA-1 or by United States Environmental Protection Agency (USEPA) Method 8260. Results of performing Methods OA-1 or 8260 provided the concentration of four volatile petroleum hydrocarbons, namely benzene, toluene, ethylbenzene, and xylenes (total), collectively BTEX. Determination of the BTEX content of the waste streams is appropriate based on toxicity and exposure considerations.

Laboratory analysis to determine the low volatility fraction of petroleum hydrocarbons in the crude oil-impacted waste made up the other half of the waste characterization effort. The laboratory method employed to analyze the Doon derailment-derived waste for the low volatility fraction of petroleum hydrocarbons in crude oil is a method specified by lowa DNR for Underground Storage Tank (UST) projects and is known as Method OA-2, Extractable Petroleum Products (and Related Low Volatility Organic Compounds). Unlike Methods OA-1 and 8260, Method OA-2 does not provide a quantitative concentration for individual

petroleum hydrocarbon compounds. Rather Method OA-2 only provides a semi-quantitative total concentration of all extractable petroleum hydrocarbon compounds for certain fractions or ranges of crude oil corresponding to major chemical attributes such as molecular weight, molecular structure, and boiling point. The petroleum hydrocarbon fractions or ranges utilized for Method OA-2 correspond to the major types of petroleum products including gasoline, diesel, and waste oil (and/or motor oil) along with a concentration for total extractable petroleum hydrocarbons. Method OA-2 is essentially a screening analysis to identify the type of petroleum product involved in a spill or release.

As previously mentioned, Method OA-2 analytical results do not provide information on the concentration of individual petroleum hydrocarbon compounds and so the potential toxicity of a petroleum product is not characterized for certain compounds of concern that are in the low volatility category of organic compounds. In particular, chemical concentration data for individual polycyclic aromatic hydrocarbons (PAHs) are not determined by Method OA-2. PAHs are a large group of organic compounds with two or more fused aromatic (benzene) rings. Low molecular weight PAHs (two and three rings) tend to be present in the vapor phase while multi-ring PAHs (five or more rings) tend to be bound to particles. Intermediate molecular weight PAHs will partition between vapor and adsorption on particles depending on the ambient temperature. Human exposure to PAHs can occur through several routes, such as inhalation of air and suspended particulates (soil and dust), consumption of food and water, and dermal (skin) contact with soil and dust. According to the Agency for Toxic Substances & Disease Registry (ATSDR), the federal government has determined that some PAHs may reasonably be expected to cause cancer and have other adverse human health effects (ATSDR 2014).

Based on review of comments made at the Joint Informational Meeting and from review of the SOPs for OWM&S, BNSF and their environmental consultant, Arcadis, appear to rely heavily on "Generator Knowledge" to select appropriate analytical parameters for the crude oil impacted waste materials. A major component of the "Generator Knowledge" appears to involve a Safety Data Sheet (SDS) from ConocoPhillips for SMA (Surmont Mix) crude oil that is provided as an appendix in the SOPs for OWM&S. A copy of the SDS is also provided in Appendix E of this report. The SDS identifies certain volatile organic compounds (VOCs) as constituents of concern for the Surmont Mix crude oil but not other possible COCs like PAHs or metals. While not mentioned on the SDS, Iowa solid waste regulations at IAC 567-109.5(2)

stipulates that special waste shall not exceed TCLP limits nor contain free liquids and also stipulates that waste not be authorized for disposal if total PAH concentration exceeds 1,600 ppm [acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluornathene, benzo(q,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorine, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene] or if total carcinogenic PAHs exceed 200 ppm [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene]. It seems inconsistent for the above regulations to specify limits on the concentrations of PAHs in special waste and then not require a special waste authorization for these petroleum contaminated materials from the Doon derailment site. The Method OA-2 results identified the presence of waste oil fraction petroleum hydrocarbons in all five waste streams as well as the diesel fraction in three waste streams (Vegetation and Soil Impacted with Crude Oil; Absorbents and Oily Debris; and Crude Bottoms). Consequently, these are potential sources of PAHs but the wastes remain uncharacterized for those potential contaminants. As discussed below in Section 4.4, a similar inconsistency is observed for selection of analytical parameters utilized for various hydrologic monitoring programs conducted by the Dickinson Landfill to verify that there are no unacceptable risks to the surrounding community associated with spills, releases, emissions and discharges from Dickinson Landfill.

3.4 No. 4: Sample Collection Procedures and Documentation

According to Section 9 of the SOPs for OWM&S, waste characterization samples were collected as composite samples by mixing equal volumes of waste from five grab samples obtained at different locations within a roll-off container or stockpile. According to this standard procedure, composite samples were used to characterize waste where the generator has identified VOCs as one of the primary COCs. It seems that the procedure included collection of five subsamples from within each equal section of the roll-off container or stockpile, combining those subsamples into one relatively large container, homogenizing the subsample material by mixing, and then scooping a portion of the homogenized material into a smaller sample container to submit for laboratory analysis. In C&F experience, it is not appropriate to use a composite sample to characterize a material where VOCs are a primary COC because mixing causes a loss of VOCs from the material and consequently skews the sampling results to lower concentration values than actual.

According to the description of waste characterization procedures provided by BNSF and DNR representatives at the Joint Informational Meeting and pursuant to Iowa solid waste regulations, the waste streams are not allowed to contain free liquids. Review of the laboratory analytical reports indicates no waste samples were subjected to testing for free liquids. No documentation such as waste sample log forms or field notes was provided that might provide descriptions of the waste materials and observations about moisture content of the waste materials.

4.0 MAJOR RELEVANT ENVIRONMENTAL REGULATORY PROGRAMS

Operation of a municipal solid waste landfill such as the Dickinson Landfill requires compliance with a host of environmental regulations involving several government regulatory programs that are implemented by various state and federal agencies. The Board has expressed a desire to be briefed about how existing environmental regulations are being applied at the Dickinson Landfill to reduce the probability that contamination arising from landfill operations could adversely affect the surrounding community. The following section presents an overview of the major environmental programs with jurisdiction over the Dickinson Landfill, including major requirements involving pollution control, environmental monitoring and reporting. In conjunction with this regulatory overview or briefing, C&F also reviewed a substantial amount of data available to the public at various government web sites in regard to Dickinson Landfill's environmental compliance record. However, this is not an exhaustive review of the potentially available information nor has it been subjected to indepth regulatory analysis and interpretation such as would be performed for an environmental compliance audit.

Iowa DNR is responsible for administering most of the environmental regulations that are applicable to the Dickinson Landfill. As such, there is significant information available at the DNR website that reveals which regulatory programs pertain to the Dickinson Landfill. The various DNR webpages provide a means to track certain activities such as submittal of permit applications for proposed new construction or new equipment. Copies of many documents such as permit applications, permits, annual reports, monitoring reports, work plans, requests for variances and other correspondence can be accessed via the DNR webpages. As an example, within the DNR website, the Facility Explorer webpage

(https://facilityexplorer.iowadnr.gov/facilityexplorer/) provides a convenient list of regulatory programs that are involved with the Dickinson Landfill. A copy of the Facility Explorer Search Results Report is provided in Appendix F. The Facility Explorer Search Results Report also has links to other state and federal webpages that provide additional information. C&F has reviewed information available at many of the webpages with links shown on the search results page as well as other government websites to assess whether there is a pattern of noncompliance or enforcement action involving the Dickinson Landfill. Our inquiries indicate the Dickinson Landfill has a good compliance record with a few relatively minor exceptions. Despite the generally positive finding about environmental compliance, these inquiries reveal some possible gaps in environmental protections that should be evaluated further and discussed with the operator, regulators, and other stakeholders. The following report sections give an overview of the most important regulatory programs that apply to the Dickinson Landfill. If relevant, the overview may include one or more C&F comments about how the public interest could potentially be better served if regulatory requirements and/or communication between Dickinson Landfill the public were modified from current practices.

4.1 Solid Waste Regulations

lowa regulates MSWLFs through its regulations contained in the Iowa Administrative Code Section 567, Chapter 113 (IAC 567.113) entitled "Sanitary Landfills for Municipal Solid Waste: Groundwater Protection Systems for the Disposal of Nonhazardous Wastes". These regulations seek to protect human health and the environment through the implementation of minimum national standards contained in the Resource Conservation and Recovery Act (RCRA). IAC 567.113 describes the permitting, siting, design, operating, monitoring, corrective action, reporting, record-keeping, closure, and post closure requirements for all MSWLFs. In Iowa, the Land Quality Bureau within DNR is charged with the responsibility for administering solid waste regulations.

The Dickinson Landfill MSWLF permit number is 30-SDP-01-75. The MSWLF permit was renewed in March of 2016 and is subject to renewal again in 2021. The previous MSWLF permit renewal was granted in January 2009 based on an application for renewal submitted to DNR in September 2006 (Liesch 2006). The 2006 permit renewal application contains 1281 pages notably including a Development and Operations Plan, and set of engineering drawings and specifications for construction of the Phase C portion of the landfill property where the

working face is currently located. The permit renewal applications reference previous submittals, where applicable, for information that remains valid and provide updated information where changes are proposed or to meet new requirements. For example, the 2013 permit renewal application contains only 138 pages including an updated Emergency Response and Remedial Action Plan (Wenck 2013a). Appendix A of the Emergency Response and Remedial Action Plan contains an Emergency Action Plan that is updated annually. There is ongoing interaction between DNR and the Dickinson Landfill as various documents and reports are submitted, reviewed by DNR, and followed with a written response from DNR. A link from the Facility Explorer Search Results Report retrieves a Facility Snapshot report that has a categorized chronological listing of the document exchanges between DNR and the Dickinson Landfill since the submittal of the September 2013 permit renewal application. A copy of Facility Snapshot Report is provided in Appendix G to illustrate the range of topics discussed between DNR and the Dickinson Landfill. Copies of these documents and others are also available at the DNR internet web site (https://programs.iowadnr.gov/solidwaste/reports/DocumentDNA). At last count, the DNR Solid Waste internet web portal had 1,233 documents in the database that are associated with the Dickinson Landfill MSWLF permit going back to 1979.

The goal of regulatory oversight is to have the Dickinson Landfill be designed and operated in a way that minimizes the probability of contamination arising from the landfill that would adversely impact soil, wildlife habitat, air quality, groundwater quality, or surface water in the surrounding area. Consequently, the requirements to receive a MSWLF permit include pollution control methods that reduce the probability that contamination arising from landfill operations could adversely affect the surrounding community. Some of the landfill design and construction safeguards include use of a liner system with a leachate collection and disposal system (except in the oldest area in the eastern 25 to 30 percent of the landfill). Additionally, a methane recovery system is currently operating in the eastern 25 to 30 percent of the landfill. Operational procedures such as waste characterization, working face rules and daily placement of cover also have a role in pollution control. Monitoring and reporting is also incorporated into the framework of environmental regulation as a further safequard. While it is beyond the scope of this report to list, describe, and discuss all of the pollution control methods utilized at the Dickinson Landfill, a recent Inspection Report by DNR gives a good indication of the important pollution control methods through its inspection checklist and lengthy notes on inspection findings pertaining to record keeping and operating

procedures (Whiting pers. com. 2018). A copy of that inspection report is provided in Appendix H. A copy of the Field Office Compliance Summary is provided in Appendix I that chronologically lists multiple inspections and any resulting actions or violations.

In addition to the waste characterization concerns discussed as part of Section 2.0, WASTE CHARACTERIZATION AND WASTE ACCEPTANCE, C&F has identified other questions or issues related to solid waste where further engagement may be appropriate. Afterwards, it may be prudent to discuss these considerations with the operator, regulators, and other stakeholders to enhance stewardship of local environmental resources.

4.1.1 Issue 1 - High Water Table

<u>Description</u>: A high water table is reportedly present in at least part of the current landfill footprint (Phases B and C) such that the required vertical separation distance of five feet between the water table and the landfill liner is not achieved without an underdrain system (Wenck 2018). The underdrain system empties into a holding pond where the groundwater is treated for VOCs by a natural wind aerator, periodically tested for VOCs, and when VOCs are less than regulatory limits, the water is discharged from the holding pond to an existing gully near the Spring Run Wetlands Complex.

<u>Concerns</u>: IDNR is considering modifying the underdrain requirement due to the high cost and significant number of landfills throughout the state with this consideration (Heib pers. com. 2018). C&F believes that the underdrain system minimizes the potential for migration of impacted groundwater by controlling the gradient. In addition, it may be appropriate to test this water for PAHs and other leachate indicator parameters before future discharges. It is questionable that this type of discharge is regulated as a stormwater discharge covered by the lowa NPDES General Permit for Industrial Users.

4.1.2 Issue 2 - Special Waste

<u>Description</u>: In addition to municipal solid waste, the Dickinson Landfill receives many types of Special Waste. Approvals for disposal of materials like railroad ties, asbestos containing materials (ACM), coal combustion ash, and petroleum contaminated soil have been given as part of the MSWLF permit conditions or by individual special waste authorizations. A variance granted by DNR to Waste Management on June 27, 2018 allows direct disposal of PCS without pre-treatment. The DNR standards for pre-treatment of PCS require the material to be spread in a layer up to 4 inches thick and then allowed to aerate for at least 14 days until the petroleum hydrocarbon concentration is less than 100 ppm. Until that time, the PCS is to be turned or disked at least three times per week; and sampled and analyzed for total petroleum hydrocarbon content once every three months prior to disposal. The variance allows Dickinson Landfill to store the PCS in the active area and incorporate it into the working face for direct disposal. Reportedly, this variance is frequently granted by IDNR to disposal facilities throughout the state. (McDonald pers. com. 2018; Smith pers. com. 2018).

Another example of the variable type of materials being placed in the Dickinson Landfill is Special Waste Authorization # 30-SWA-11-18 issued by DNR to the Dickinson Landfill in September 2018 (Johnson pers. com. 2018). The new Special Waste Authorization authorizes immediate disposal of approximately 1,000,000 pounds of mixed waste including televisions, monitors computers and other electronic waste with dirt, wood, cardboard, broken CRT glass and other debris. This waste was released from the Sioux City Planning Area and its disposal is associated with EPA Consent Agreement and Final Order, Docket No. RCRA-07-2018-0248, dated July 17, 2018.

<u>Concern</u>: The hydrologic monitoring performed at the landfill may not include analytical parameters capable of evaluating whether hazardous constituents within special waste are present in shallow groundwater and surface water. Given its location in a sensitive ecological area such as the Spring Run Wetlands Complex, additional monitoring of the Dickinson Landfill facility may be warranted. Also, the June 27, 2018 PCS variance specifies that the untreated PCS must not contain free liquids as determined by the paint filter liquids test. No laboratory analytical reports containing paint filter liquids test results have been provided.

4.1.3 Issue 3 - VOCs in Groundwater

In the mid 1990's volatile organic compounds (VOCs) were detected in three monitoring wells (MW-11, MW-12 and MW-23) located in close proximity to each other in the northeastern portion of the Dickinson Landfill (Liesch 2009). Three monitoring wells with VOC detections in groundwater are located adjacent to the oldest part of the landfill in the eastern 25 to 30 percent of the permitted area where no landfill liner is present. The source of the VOCs was evaluated through completion of a Supplemental Groundwater Quality Assessment conducted on behalf of the landfill owner, Sanifll, Inc. (Sanifill) (Geomatrix, 1996). The supplemental assessment included an evaluation of groundwater and leachate isotope chemistry, monitoring well head-space gas chemistry (ie. soil vapor), groundwater chemistry, groundwater level relationships, site geology and landfill construction. The methods of data collection and analyses focused on distinguishing VOC detections sourced by subsurface migration of landfill gas from those associated with a leachate release. According to Geomatrix, the investigation concluded that the source of the VOCs was subsurface migration of landfill gas and that the lateral and vertical extent of the VOC impacts was limited by the low-permeability native soils that are derived from clay-rich glacial till deposits. In 1997, Sanifill installed and operated three passive gas vent wells into the older portion of the landfill near the affected wells as a response action.

Dickinson Landfill continues to conduct landfill gas extraction as a groundwater corrective action to mitigate the detection of VOCs within monitoring wells located in the northeastern portion of the Dickinson Landfill. Additional gas extraction wells have been installed along with a mechanical system to collect and vent the landfill gas (Liesch 2009). The layout of the gas collection system is shown on Figure 3 from the 2017 Annual Monitoring Report that is provided in Appendix A. The landfill gas extraction system may also diminish odor associated with uncontrolled venting of landfill gas. In examining the effectiveness of gas extraction system in reducing VOC concentrations, Dickinson Landfill previously estimated that this corrective action will need to operate at least to 2029 (Liesch 2009). Management of landfill gas and an approved methane-monitoring program as per IAC 113.9 is also specified in Dickinson Landfill's March 12, 2009 Revised Operations Plan and Revised Methane Migration Plan (Document No. 39056).

4.2 Emergency Response Planning

According to the Special Provisions of the June 27, 2018 revised MSWLF permit, the permit holder is to follow the Emergency Response and Remedial Action Plan (ERRAP) procedures during all emergencies pursuant to IAC 567.113.8(5). The permit holder is also required to submit an updated ERRAP at the time of each permit renewal application (every 5 years). In addition, an updated ERRAP must be included with any request for permit modification to incorporate a facility expansion or significant changes in facility operation that require modification of the currently approved ERRAP. The current ERRAP is dated September 30, 2013 (Wenck 2013b).

The ERRAP describes a variety of potential emergency situations that could affect the Dickinson Landfill and also outlines response actions, equipment needed and timetables for correcting the problems. A list of people to contact for each type of emergency situation is also provided in the ERRAP. The contact list typically includes certain Dickinson Landfill staff and Waste Management staff, along with the Dickinson County Sheriff's Dept., DNR Emergency Response and DNR Filed Office No. 3. In some cases, the National Response Center is also to be notified.

According to the ERRAP, the Dickinson Landfill employees will receive baseline and refresher training about emergency response procedures, health and safety measures, spill prevention and containment, stormwater management instructions and where to find phone numbers for reporting a significant spill or other emergency. The employee training is reported to include instructions on the appropriate chain of command in reporting emergency response activities. In addition, all new Landfill personnel will be properly trained in the use of emergency response and spill control equipment. The ERRAP specifies that Dickinson Landfill personnel are to take limited actions to mitigate the emergency and notify the Landfill's District Manager who will determine if the appropriate Emergency Response Contractors need to be notified/contacted.

Annual refresher training that consists of yearly briefings will also be provided by Dickinson Landfill for operating personnel to ensure adequate understanding of the ERRAP. Yearly briefings will also highlight known emergency response events or failures and recently developed precautionary measures. Training may also include periodic simulation of an onsite vehicular spill to prepare for a possible on-site spill emergency response. Records of the briefings and spill prevention training are to be kept on file at the Dickinson Landfill.

Appendix A of the 2013 ERRAP contains another emergency planning document that is entitled "Dickinson Landfill, Inc., Emergency Action Plan". The Emergency Action Plan states that it was reviewed and revised in November 2012 and that it has been prepared pursuant to certain federal regulations [40 CFR 567-102.12 (8)]. As mentioned previously, the Emergency Action Plan that is to be updated annually. Dickinson Landfill staff, subcontractors and any other personnel on site are to abide by the Emergency Action Plan.

The Emergency Action Plan contains the following the elements for this site:

- What constitutes an emergency.
- How the emergency plan is activated.
- Responsibilities of employees during a site emergency.
- Relevant telephone numbers concerning a site emergency.
- Emergency medical treatment and first aid.
- Means of Egress (Exit).

In the event of an emergency, it may be necessary for the Program Administrator or, in their absence, the Emergency Coordinator, to activate the Dickinson Landfill's "Emergency Action Plan". If so, an evacuation of the site will occur, and an evacuation order is to be given over the site radio system.

The Emergency Action Plan also specifies procedures to follow for different types of emergencies including emergency medical treatment and first aid response, fire emergency response, chemical spill response, tornado/severe weather response, and winter storm/blizzard response. Emergency phone numbers provided for local government entities include the Dickinson County Sheriff Dept., the Milford Fire Dept, Spirit Lake Ambulance, and the Dickinson County Engineer.

A Waste Management Bloodborne Pathogen Guidance Plan is provided in Appendix B of the 2013 ERRAP to comply with the Occupational Safety and Health Administration's (OSHA) Bloodborne Pathogen Standard (29 CFR 1910.1030). It was revised in December 2010 and

states that it must be reviewed yearly. The Bloodborne Pathogen Guidance Plan identifies job classifications that may have occupational exposure to bloodborne pathogens including heavy equipment operator, maintenance/mechanic, paper picker/laborer, and the supervisor who is responsible for bloodborne pathogen and/or sharps cleanup. Engineering and work practice controls are described in the Bloodborne Pathogen Guidance Plan as are personal protective equipment (PPE) and cleanup and housekeeping procedures. Mr. Jeff Vassar is listed as the Responsible Person for review and updating of the exposure Control Plan and for its implementation.

4.3 Air Quality Regulations

MSWLFs release air pollutants that may be subject to state and federal regulations. As the waste in a landfill decomposes, it breaks down to form landfill gases, such as methane (CH4), carbon dioxide (CO2), and non-methane organic compounds (NMOC). Landfills also can produce smog-causing volatile organic compounds (VOCs), and air toxics pollutants that are known or suspected of causing cancer and other serious health effects. Particulate Matter (PM) emissions can also be generated in the form of fugitive dust created by mobile sources (i.e., garbage trucks) traveling along paved and unpaved surfaces.

lowa has promulgated air quality regulations based on federal standards and these are administered by the Air Quality Bureau of DNR. Review of available information from the DNR website indicates that two DNR Air Quality Bureau construction permits for the landfill (Plant No. 30-01-017) are currently active. Copies of two reports from the Air Quality Bureau's Construction Permit Search web pages with information on the Dickinson Landfill construction permits are provided in Appendix L. Both were issued in February 2011 and these include one for uncollected gas emissions from the landfill (Emissions Point 1, 11-A-088) and one for Emissions Point 5 associated with Flare No. 1 that is part of the gas collection system at Dickinson Landfill. The current design capacity regarding the quantity of waste that can be accepted for disposal is below the federal criteria that stipulate more stringent regulatory requirements related to air quality. Consequently, requirements for operations, emissions, monitoring and reporting are minimal for the Dickinson Landfill. The regulatory basis for certain permit conditions is presented below from the construction permits for both the uncollected gas emissions source and the collected gas emissions source. A few permit conditions are also included in the information shown below.

Uncollected Gas

"The landfill is subject to federal New Source Performance Standards (NSPS) for MSW landfills NSPS Subpart WWW (40 CFR §60.750 - 40 CFR §60.759) - Standards of Performance for Municipal Solid Waste Landfills. The MSW landfill is also subject to the General Provisions of Subpart A (40 CFR §60.1 - 40 CFR §60.19).

The design capacity of this MSW landfill is less than 2.5 million megagrams or is less than 2.5 million cubic meters. The landfill is not a major source of hazardous air pollutants (HAPs) or collocated with a major source of HAPs. Based on this information, at this time the landfill is not subject to NESHAP Subpart AAAA (40 CFR §63.1930 - 40 CFR §63.1990) National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills.

The operating limits for this emission unit shall be:

A. The capacity of the municipal solid waste (MSW) landfill covered by this permit shall not exceed 2.4 million megagrams. This limit shall be considered to be the landfill's design capacity for applicability purposes of 40 CFR Part 60, Subpart WWW. The capacity limit applies to the total amount of solid waste that is, or will be, located in the following areas of the MSW landfill: all closed sections of the landfill (i.e. in-place waste), all open landfill areas or cells that are currently receiving waste, and all future open areas or cells of the MSW landfill. This limit applies to the entire MSW landfill in a contiguous geographical space that is used, or has been used, for the disposal of municipal solid waste. This limit does not preclude the owner or operator from having to comply with any other local, state or federal permit that limits or defines the design capacity of the landfill.

All records as required by this permit shall be kept on-site for a minimum of five (5) years and shall be available for inspection by the DNR. Records shall be legible and maintained in an orderly manner. These records shall show the following:

A. The owner or operator of the MSW landfill shall maintain the following monthly records:

i. The amount of solid waste accepted or received at the MSW landfill in mass (megagrams);

ii. The total amount of solid waste that has been received at the landfill in all open and closed areas of the MSW landfill in mass (megagrams)."

The construction permit does not require any compliance demonstrations or performance testing. There is no requirement for continuous emission monitoring associated with this permit.

Collected Gas

"The landfill is subject to NSPS Subpart WWW (40 CFR §60.750 - 40 CFR §60.759) - Standards of Performance for Municipal Solid Waste Landfills. The MSW landfill is also subject to the General Provisions of Subpart A (40 CFR §60.1 - 40 CFR §60.19).

The design capacity of this MSW landfill is less than 2.5 million megagrams or is less than 2.5 million cubic meters. The landfill is not a major source of HAPs or collocated with a major source of HAPs. Based on this information, at this time the landfill is not subject to NESHAP Subpart AAAA (40 CFR §63.1930 - 40 CFR §63.1990) National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills.

NOTE: At this time Dickinson Landfill is not required to install a gas collection and control system (GCCS) to meet the requirements of NSPS Subpart WWW. Installation of the GCCS is to minimize emissions/odors.

All records as required by this permit shall be kept onsite for a minimum of five (5) years (unless otherwise stated in NSPS Subpart WWW) and shall be available for inspection by the DNR. These records shall demonstrate compliance with all applicable operating limits. Records shall be legible and maintained in an orderly manner.

- 1) The owner/operator shall install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment for the flare:
 - a) A heat sensing device such as an ultraviolet beam sensor or thermocouple at the pilot light or the flame itself to indicate the continuous presence of a flame.
 - b) A device that records flow to or bypass of the flare. The owner or operator shall either:
 - i) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; or
 - ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line."

The construction permit does not require any compliance demonstrations or performance testing. There is no requirement for continuous emission monitoring associated with this permit. C&F is not aware of any air quality monitoring done in the immediate vicinity of the landfill by lowa DNR or other parties.

4.4 Surface Water Quality Regulations (NPDES)

The Dickinson Landfill is subject to certain requirements of the National Pollutant Discharge Elimination System (NPDES), a federal permit program that seeks to mitigate water pollution by regulating point sources that discharge pollutants to waters of the United States. A point source is defined as "any discernible, confined and discrete conveyance, such as a pipe, ditch, channel, tunnel, conduit, discrete fissure, or container. It also includes vessels or other floating craft from which pollutants are or may be discharged." An NPDES permit is probably needed if your facility has a discharge from a point source into the waters of the United States. In contrast, if you discharge pollutants into a municipal sanitary sewer system, you do not need an NPDES permit. Another common scenario involves discharge of pollutants into a municipal storm sewer system, in which case a NPDES permit may be needed depending on what is discharged.

There are two basic classifications of NPDES permits which are individual permits and general permits. The permit application process and requirements, such as monitoring and reporting, involve a greater level of effort for individual permits. An individual permit reflects site-specific conditions for a single discharger based on information submitted by that discharger in a permit application. Individual permits are issued directly to an individual discharger. A NPDES general permit is written to cover multiple dischargers with similar operations and types of discharges based on the government regulatory agency permit writer's professional knowledge of those types of activities and discharges. The general permit is issued to no one in particular with multiple dischargers obtaining coverage under that general permit after it is issued by the government regulatory agency. The NPDES permit applications and the permit conditions also vary depending on the type of activity that is associated with the discharge such as Animal Feeding Operations, Industrial Waste Water, Municipal Water and Stormwater. Iowa has an authorized NPDES program that meets the requirements of federal regulations and it is administered by the DNR.

The Dickinson Landfill is subject to the NPDES regulations in regard to stormwater runoff that discharges from the landfill. Currently, Dickinson Landfill has NPDES stormwater coverage under lowa General Permit No. 1 for stormwater associated with industrial activity (DNR Authorization # IA - 19336 - 19107). Dickinson Landfill renewed their NPDES permit most recently in October 2015. The permit is valid through November 2020. The latest version of

General Permit No. 1 issued by the State of Iowa is in effect for the period from March 1, 2018 through February 28, 2023.

Routing of storm water runoff at the site is described in Section 6.5 of the Storm Water Pollution Prevention Plan (SWPPP) that has been prepared for the Dickinson Landfill as required by the NPDES permit (Barker Lemar 2018b). The official "representative" stormwater discharge from the landfill occurs at Outfall 2A located near the southwest corner of Dickinson Landfill's current landfill permitted footprint as shown on a copy of Figure 2 from the 2018 SWPPP presented in Appendix J. The permit application references receiving waters as "unnamed creek tributary to Lower Gar Lake". According to the SWPPP, storm water from the majority of the site flows over the ground surface into perimeter swales, ditches, terraces, surface water piping, and culverts to the main sedimentation pond in the southwestern portion of the site. The sedimentation pond discharges into the unnamed tributary to Lower Gar Lake. However, as described in the SWPPP, there are other storm water discharges from the site as follows:

- Runoff from the eastern side of the closed portion of the landfill flows to the east and is directed to terraces and downslope structures to the eastern sedimentation pond before eventually flowing to an unnamed tributary to Lower Gar Lake.
- Stormwater from the western portion of the closed area of the landfill flows to the south and is directed to terraces and downslope structures to the middle sedimentation pond before eventually flowing to an unnamed tributary to Lower Gar Lake.
- The direction of flow in the maintenance shop area is to the south along the road ditch to the east sedimentation pond on the eastern portion of the site before eventually flowing to an unnamed tributary to Lower Gar Lake.

According to the SWPPP, storm water monitoring at Dickinson Landfill consists of collecting one sample from Outfall 2A annually. The SWPPP specifies that sampling is to occur when discharge resulting from a storm event is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previous storm event greater than 0.1 inches in magnitude. The storm water sample is to be analyzed for a list of 25 parameters consisting mainly of major cations and anions, metals, and screening parameters such as chemical oxygen demand, total dissolved solids, total organic carbon and oil and grease. Neither VOCs nor PAHs are among the required analytical parameters for the annual NPDES sample. Groundwater seepage into the liner underdrain system is also a component of the "stormwater" discharge from this site. The liner underdrain system flows into a groundwater holding pond located as shown on the copy of SWPPP Figure 2 provided in Appendix J. According to information provided in Section 5.5 of the SWPPP, the water in the groundwater holding pond is tested and then batch discharged pursuant to the solid waste permit. NPDES Storm Water General Permit No. 1 does not require reporting of sampling results and does not have effluent water quality limits. The annual stormwater sampling results must be available for inspection at the site.

Dickinson Landfill previously had NPDES coverage for stormwater discharges through an individual permit (#3000902) that was in effect from approximately 2002 to 2010. The individual permit had two outfalls: Outfall 001 - discharge from groundwater holding pond, and Outfall 002 - discharge from wetland complex. Under the individual permit, there were effluent water quality limits for two VOCs, trichloroethylene (TCE) and cis-1,2-dichloroethylene (cis-1,2-DCE) as well as total suspended solids, Iron (total) and TDS. Storm water sampling was to be conducted monthly for certain analytical parameters and semiannually for others. Stormwater monitoring results were to be reported quarterly and included as part of the landfill's annual monitoring report as specified in the 2009 Hydrologic Monitoring System Plan (Liesch 2009) and solid waste permit.

In response to a request for information made by C&F on November 30, 2018, Dickinson Landfill provided a copy of a TestAmerica laboratory report from analysis of one stormwater sample collected on July 5, 2018 (TestAmerica Job ID: 480-138530-1). Analytical parameters were as specified in the SWPPP except that the sample had also been analyzed for VOCs. The sample documentation contained in the laboratory report does not indicate where the sample was collected at the Dickinson Landfill. Dickinson Landfill indicated that there was no discharge at the monitoring point from a qualifying storm event in either 2016 or 2017 according to the December 18, 2018 memorandum from Dickinson Landfill in response a request for information.

Additional protections should be considered in regard to stormwater discharges from Dickinson Landfill, given the location of the landfill in the midst of wildlife management areas and a significant wetlands complex. Existing stormwater monitoring (number of sampling locations, sampling frequency, and analytical parameters) and reporting may not be adequate

to assess the potential impact of the landfill on surface water quality and dependent ecological systems. It may be appropriate to consult with regulators about whether surface water in the immediate vicinity of the landfill could be considered as Outstanding National Resource Water or Outstanding State Resource Water that would require an individual NPDES permit for Dickinson Landfill as stipulated in paragraph 567-61.2(2)" e" of the Iowa Administrative Code and in the Iowa Antidegradation Implementation Procedure.

4.5 Wetlands

In 2015, wetlands delineation identified 1.2 acres of jurisdictional wetlands in an area designated for future expansion of the landfill (McDonald pers. com. 2015). In order to retain the proposed footprint for future development of the landfill, Dickinson Landfill submitted an application to the Department of the Army, Corps of Engineers (Corps) to fill the wetlands. If approved by the Corps, DNR regulations would allow the proposed landfill expansion since siting and location restrictions concerning wetlands specified by 567. 113.6 do not apply to permitted MSWLF units which have been approved prior to October 1, 2007. The Corp did issue the permit to Dickinson Landfill on December 8, 2016 and it is valid until December 31, 2041 (Permit # CEMVR-OD-P-2015-169). The locations of the wetlands to be destroyed by the future landfill expansion are shown on the copy of Figure 2 from the Corps 2015 permit document that is provided in Appendix K. According to Special Condition No. 1 in the Corps 2015 permit, Dickinson Landfill must purchase 1.2 acre/credit from Owego Wetland Mitigation Bank in order for the permit to be valid.

A few considerations about the current stormwater flow from the landfill into the adjoining wetland areas and about the future expansion of the landfill into the onsite wetlands follow:

- Periodic monitoring and inspection of the wetlands immediately downstream of the landfill may be appropriate.
- A baseline environmental assessment for the wetlands just downstream of the areas to be filled may be appropriate.
- The timeline of the construction project in the 1.2 acres of wetlands at the site is unknown.

5.0 SUMMARY OF POTENTIAL CONCERNS AND SUGGESTED FOLLOW-UP

As home to the lowa Great Lakes and other high quality ecological systems, Dickinson County must continue to be proactive about protecting its natural resources and quality of life. Therefore, the Dickinson County Board of Supervisors (Board) retained Coggin & Fairchild Environmental Consultants to review the waste characterization and waste acceptance process utilized by BNSF, IDNR, and Waste Management for the Doon derailment-derived waste streams delivered to the Dickinson Landfill. The Board also was concerned about how existing environmental regulations are being applied at the Dickinson Landfill in order to reduce the probability that contamination arising from landfill operations could adversely affect the surrounding community.

The evaluation has revealed that the Dickinson Landfill is highly regulated and has a good compliance record based on review of publicly available documents. Further, it appears to be operated and regulated by competent and well-meaning people. However, it is still prudent to have public scrutiny of the Dickinson Landfill so that all stakeholders are accountable for effective environmental stewardship that is consistent with local values. In the process of performing the evaluation on behalf of the Board, multiple concerns, or issues about placement of the Doon waste streams at the Dickinson Landfill have been identified. Additional concerns remain about the adequacy of the existing regulatory requirements and operating procedures to provide the necessary level of environmental protection. The potential concerns, issues and questions identified by this investigation are summarized in a list provided in Appendix M. The list is organized in a manner consistent with the main headings in the text of this report.

The Board should consider engaging in additional dialogue with regulators and the operator as appropriate to obtain additional information and further evaluate the potential concerns or issues noted. The Board may request that regulatory agencies review current permit monitoring requirements. In addition, the Board could request notification of future communications and notifications about regulatory matters like proposed new special waste authorizations, variances and inspection results from the operator and DNR. The Board could facilitate cooperation among other stakeholders such as lowa Natural Heritage Foundation, Dickinson Clean Water Alliance, Dickinson County Water Quality Commission, Ducks Unlimited, Dickinson County Conservation Board, Iowa Audubon, or Natural Resources

Conservation Service to develop a plan to conduct an independent inspection of site conditions at the landfill and for monitoring of nearby surface water quality and habitat. The community stakeholders may also seek additional protections for the property near the landfill that would result from designations such as Outstanding National Resource Water or Outstanding State Resource Water.

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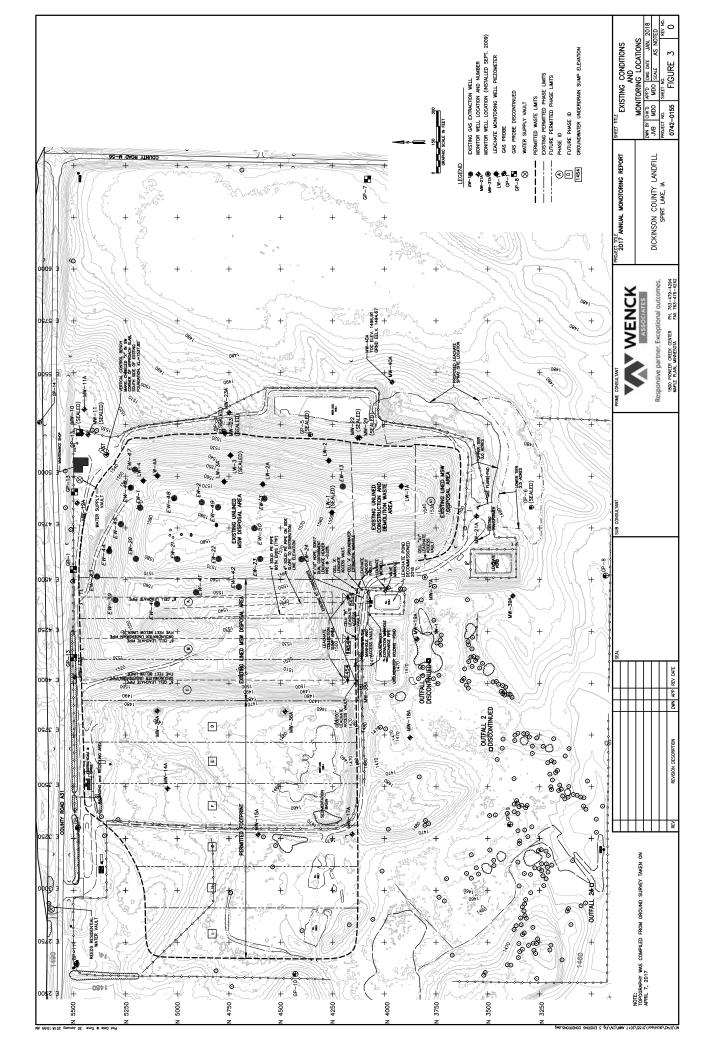
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APPENDIX A

Figure 3, Existing Conditions and Monitoring Locations, from 2017 Annual Monitoring Report prepared by Wenck Associates



APPENDIX B

Selected Pages from EDR GeoCheck® Report 5431101_2 Pertaining to Water-Supply Well Search Records

Dickinson County Landfill, Inc.

2975 190th Street Spirit Lake, IA 51360

Inquiry Number: 5431101.2s September 21, 2018

The EDR GeoCheck® Report



6 Armstrong Road, 4th floor Shelton, CT 06484 Toll Free: 800.352.0050 www.edrnet.com

GEOCHECK[®] - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

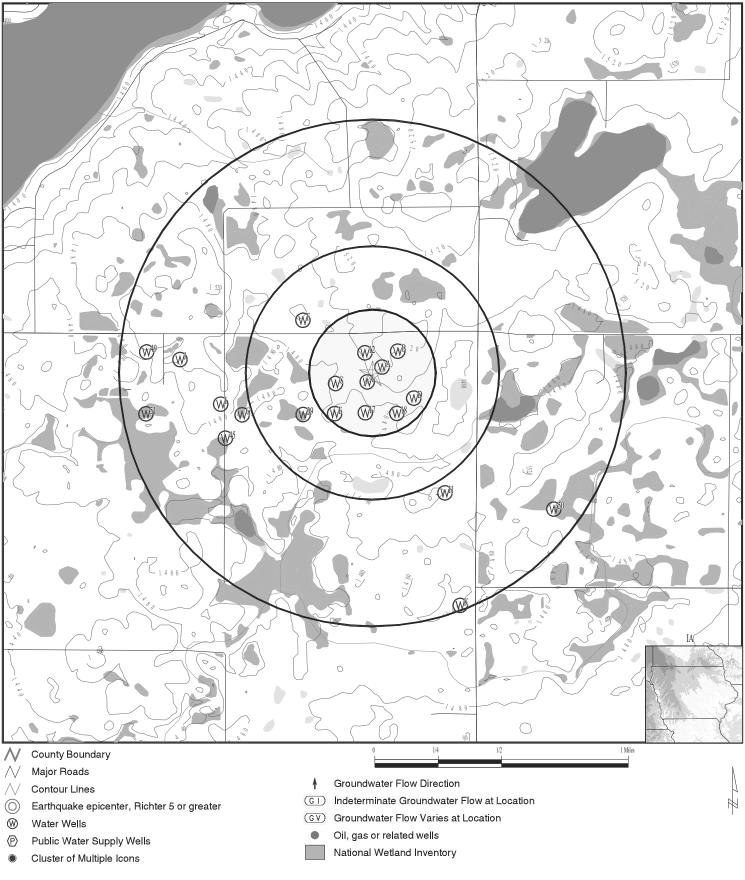
MAP ID	WELL ID	LOCATION FROM TP
1	IAPU40000191084	0 - 1/8 Mile SSW
A2	IAPU4000003638	0 - 1/8 Mile ENE
A3	IAPU4000003639	0 - 1/8 Mile ENE
A4	IAPU4000003640	0 - 1/8 Mile ENE
A5	IAPU4000003641	0 - 1/8 Mile ENE
A6	IAPU4000003642	0 - 1/8 Mile ENE
A7	IAPU4000003643	0 - 1/8 Mile ENE
A8	IAPU4000003644	0 - 1/8 Mile ENE
A9	IAPU4000003645	0 - 1/8 Mile ENE
A10	IAPU4000003646	0 - 1/8 Mile ENE
A11	IAPU4000003647	0 - 1/8 Mile ENE
12	IAPU40000191083	0 - 1/8 Mile NNW
B13	IAPU4000003651	1/8 - 1/4 Mile NE
B13 B14	IAPU4000003652	1/8 - 1/4 Mile NE
C15		1/8 - 1/4 Mile NE
	IAPU40000191070 IAPU40000191069	1/8 - 1/4 Mile WSW
C16 17	IAPU40000191089	1/8 - 1/4 Mile W3W
18	IAPU40000191089	1/8 - 1/4 Mile SSE
D19	IAPU40000300417	1/8 - 1/4 Mile ESE
D20	IAPU40000300416	1/8 - 1/4 Mile ESE
D21	IAPU40000300418	1/8 - 1/4 Mile ESE
D22	IAPU40000300419	1/8 - 1/4 Mile ESE
D23	IAPU40000300421	1/8 - 1/4 Mile ESE
D24	IAPU40000300423	1/8 - 1/4 Mile ESE
D25	IAPU40000300422	1/8 - 1/4 Mile ESE
D26	IAPU40000300424	1/8 - 1/4 Mile ESE
E27	IAPU40000191072	1/8 - 1/4 Mile SW
E28	IAPU40000191071	1/8 - 1/4 Mile SW
29	IAPU40000300388	1/4 - 1/2 Mile WSW 1/4 - 1/2 Mile NW
F30	IAPU40000215077	
F31	IAPR40000042134	1/4 - 1/2 Mile NW
F32	IAPR40000067567	1/4 - 1/2 Mile NW
F33	IAPU40000215076	1/4 - 1/2 Mile NW
F34	IAPU40000300384	1/4 - 1/2 Mile NW
G35	IAPU40000300368	1/2 - 1 Mile WSW
G36	IAPU40000300370	1/2 - 1 Mile WSW
H37	IAPU40000215291	1/2 - 1 Mile SSE
H38	IAPR40000042340	1/2 - 1 Mile SSE
139	IAPW40000068261	1/2 - 1 Mile WSW
140	IAPU4000082553	1/2 - 1 Mile WSW
141	IAPU4000003575	1/2 - 1 Mile WSW
142	IAPW40000048635	1/2 - 1 Mile WSW
143	IAPU4000082554	1/2 - 1 Mile WSW
144	IAPW4000063997	1/2 - 1 Mile WSW
45	IAPU4000082563	1/2 - 1 Mile WSW
J46	IAPU4000082534	1/2 - 1 Mile West
J47	IAPW40000001465	1/2 - 1 Mile West
J48	IAPU4000003541	1/2 - 1 Mile West
49	IAPU40000300321	1/2 - 1 Mile West
50	IAPU40000300481	1/2 - 1 Mile SE
51	IAPU40000300326	1/2 - 1 Mile West
K52	IAPU40000300465	1/2 - 1 Mile SSE

GEOCHECK[®] - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID K53 WELL ID IAPU40000300467 LOCATION FROM TP 1/2 - 1 Mile SSE

PHYSICAL SETTING SOURCE MAP - 5431101.2s



LAT/LONG: 43.369036 / 95.080397 DATE: September 21, 2018 1:06 pm	ADDRESS: 2975 190th Street Spirit Lake IA 51360	CLIENT: Gary Cipriano CONTACT: Gary Cipriano INQUIRY #: 5431101.2s DATE: September 21, 2018 1:06 pm
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Map ID Direction				
Distance Elevation		Datal	base	EDR ID Number
1 SSW 0 - 1/8 Mile Lower		IA WE	ELLS	IAPU40000191084
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 18588 Well Type: 30 Construction/Permit Primary use: Monitoring/observation	t Date:		nitted private wells /1996
A2 ENE 0 - 1/8 Mile Higher		IA WE	ELLS	IAPU40000003638
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 38151 Well Type: 20 Construction/Permit Bedrock depth: 0; Well type: Monitor	t Date:		well database /1996
A3 ENE 0 - 1/8 Mile Higher		IA WE	ELLS	IAPU40000003639
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 38129 Well Type: 20 Construction/Permit Bedrock depth: 0; Well type: Monitor	t Date:		well database /1996
A4 ENE 0 - 1/8 Mile Higher		IA WE	ELLS	IAPU4000003640
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 52639 Well Type: 28 Construction/Permit Bedrock depth: 0; Well type: Monitor	t Date:		well database /2000
A5 ENE 0 - 1/8 Mile Higher		IA WE	ELLS	IAPU40000003641
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 38127 Well Type: 25 Construction/Permit Bedrock depth: 0; Well type: Monitor	t Date:		well database /1996

Map ID Direction Distance			
Elevation		Database	EDR ID Number
A6 ENE 0 - 1/8 Mile Higher		IA WELLS	IAPU40000003642
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 38153 Well Type: 20 Construction/Permit Date Bedrock depth: 0; Well type: Monitor		well database 1996
A7 ENE 0 - 1/8 Mile Higher		IA WELLS	IAPU40000003643
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 38150 Well Type: 21 Construction/Permit Date Bedrock depth: 0; Well type: Monitor		well database 0/1996
A8 ENE 0 - 1/8 Mile Higher		IA WELLS	IAPU40000003644
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 38154 Well Type: 25 Construction/Permit Date Bedrock depth: 0; Well type: Monitor		well database 0/1996
A9 ENE 0 - 1/8 Mile Higher		IA WELLS	IAPU4000003645
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 38128 Well Type: 48 Construction/Permit Date Bedrock depth: 0; Well type: Monitor		well database 0/1996
A10 ENE 0 - 1/8 Mile Higher		IA WELLS	IAPU4000003646
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 52640 Well Type: 28 Construction/Permit Date Bedrock depth: 0; Well type: Monitor		well database n

Map ID Direction Distance				
Elevation		Databa	ase	EDR ID Number
A11 ENE 0 - 1/8 Mile Higher		IA WEI	LLS	IAPU40000003647
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 38152 Well Type: 25 Construction/Permit I Bedrock depth: 0; Well type: Monitor	Date:		well database /1996
12 NNW 0 - 1/8 Mile Higher		IA WEI	LLS	IAPU40000191083
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 18587 Well Type: 25 Construction/Permit I Primary use: Monitoring/observation	Date:		nitted private wells /1996
B13 NE 1/8 - 1/4 Mile Higher		IA WEI	LLS	IAPU40000003651
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 47129 Well Type: 32 Construction/Permit I Bedrock depth: 0; Well type: Monitor	Date:		well database /1998
B14 NE 1/8 - 1/4 Mile Higher		IA WEI	LLS	IAPU4000003652
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 47128 Well Type: 32 Construction/Permit I Bedrock depth: 0; Well type: Monitor	Date:		well database /1998
C15 WSW 1/8 - 1/4 Mile Lower		IA WEI	LLS	IAPU40000191070
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 18581 Well Type: 30 Construction/Permit I Primary use: Monitoring/observation	Date:		nitted private wells /1996

Map ID Direction Distance				
Elevation		Databa	se	EDR ID Number
C16 WSW 1/8 - 1/4 Mile Lower		IA WELLS		IAPU40000191069
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 18582 Well Type: 25 Construction/Permit D Primary use: Monitoring/observation	ate:		hitted private wells /1996
17 South 1/8 - 1/4 Mile Lower		IA WELI	LS	IAPU40000191085
Database:	All Known Water Wells in the State of Iowa			
Well ID:	18585 Well Type:			nitted private wells
Well Depth: Notes:	25 Construction/Permit D Primary use: Monitoring/observation	ate:	3/29/	/1996
18 SSE 1/8 - 1/4 Mile Lower		IA WELI	LS	IAPU40000191089
Database: Well ID:	All Known Water Wells in the State of Iowa 18586 Well Type:		Dorm	aittad private walls
Well Depth: Notes:	18586 Well Type: 47 Construction/Permit D Primary use: Monitoring/observation	ate:		nitted private wells /1996
D19 ESE 1/8 - 1/4 Mile Lower		IA WELI	LS	IAPU40000300417
Database:	All Known Water Wells in the State of Iowa			
Well ID:	33641 Well Type:		Regi	stered abandoned wells
Well Depth: Notes:	20 Construction/Permit D Well plugged: 9/15/1998; Well type: < 18" dia.	ate:	n.a.	
D20 ESE 1/8 - 1/4 Mile Lower		IA WELI	LS	IAPU40000300416
Database:	All Known Water Wells in the State of Iowa			
Well ID:	33643 Well Type:		-	stered abandoned wells
Well Depth: Notes:	20 Construction/Permit D Well plugged: 9/16/1998; Well type: < 18" dia.	ate:	n.a.	
110103.	won plugged. or for 1000, wen type. < 10 dia.			

Map ID Direction Distance			
Elevation		Database	EDR ID Number
D21 ESE 1/8 - 1/4 Mile Lower		IA WELLS	IAPU40000300418
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 33645 Well Type: 55 Construction/Permit D Well plugged: 9/16/1998; Well type: < 18" dia.		gistered abandoned wells
D22 ESE 1/8 - 1/4 Mile Lower		IA WELLS	IAPU40000300419
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 33639 Well Type: 25 Construction/Permit D Well plugged: 9/15/1998; Well type: < 18" dia.		gistered abandoned wells
D23 ESE 1/8 - 1/4 Mile Lower		IA WELLS	IAPU40000300421
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 33642 Well Type: 39 Construction/Permit D Well plugged: 9/15/1998; Well type: < 18" dia.		gistered abandoned wells
D24 ESE 1/8 - 1/4 Mile Lower		IA WELLS	IAPU40000300423
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 33640 Well Type: 24 Construction/Permit D Well plugged: 9/15/1998; Well type: < 18" dia.		gistered abandoned wells
D25 ESE 1/8 - 1/4 Mile Lower		IA WELLS	IAPU40000300422
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 33647 Well Type: 35 Construction/Permit D Well plugged: 9/17/1998; Well type: < 18" dia.		gistered abandoned wells

Map ID Direction Distance			
Elevation	[Database	EDR ID Number
D26 ESE 1/8 - 1/4 Mile Lower	1 I	A WELLS	IAPU40000300424
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 33644 Well Type: 19 Construction/Permit Date: Well plugged: 9/16/1998; Well type: < 18" dia.	Reg n.a.	istered abandoned wells
E27 SW 1/8 - 1/4 Mile Lower	l,	A WELLS	IAPU40000191072
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 18583 Well Type: 30 Construction/Permit Date: Primary use: Monitoring/observation		nitted private wells /1996
E28 SW 1/8 - 1/4 Mile Lower	l,	A WELLS	IAPU40000191071
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 18584 Well Type: 30 Construction/Permit Date: Primary use: Monitoring/observation		nitted private wells /1996
29 WSW 1/4 - 1/2 Mile Lower	IJ	A WELLS	IAPU40000300388
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 26822 Well Type: 25 Construction/Permit Date: Well plugged: 9/24/1996; Well type: > 18" dia.	Reg n.a.	istered abandoned wells
F30 NW 1/4 - 1/2 Mile Lower	l,	A WELLS	IAPU40000215077
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of Iowa 67568 Well Type: 50 Construction/Permit Date: Drilling method: Augered; Known well depth	Well unkr	ls registered for testing n

Map ID Direction				
Distance Elevation			Database	EDR ID Number
F31 NW 1/4 - 1/2 Mile Lower			IA WELLS	IAPR40000042134
Database: Depth Reliability: Sample Date: Sampling Location: Bacteria Results: Safe/Unsafe Nitrate Level: Nitrate Remarks: Method Accuracy: Material Accuracy: Diameter Accuracy: Year Accuracy:	Private Wells Tested K 10-SEP-90 KITCHEN FAUCET 0 S Not Reported Not Reported Not Reported U U	Well Depth: Private Permit #: Analysis Date: Safe/Unsafe Bacteria Lev Bacteria Remarks: Nitrate Results: Construction Method: Casing Material: Casing Diameter: Year Constructed: Agent:	12-5 vel: S Not 35 AUC UNM 0 0	Reported SEP-90 Reported SURED (NOWN
F32 NW 1/4 - 1/2 Mile Lower			IA WELLS	IAPR40000067567
Database: Depth Reliability: Sample Date: Sampling Location: Bacteria Results: Safe/Unsafe Nitrate Level: Nitrate Remarks: Method Accuracy: Material Accuracy: Diameter Accuracy: Year Accuracy:	Private Wells Tested K 23-AUG-90 UNKNOWN 0 U Not Reported Not Reported Not Reported U U	Well Depth: Private Permit #: Analysis Date: Safe/Unsafe Bacteria Lev Bacteria Remarks: Nitrate Results: Construction Method: Casing Material: Casing Diameter: Year Constructed: Agent:	Not vel: S Not Q AUC UNK 0 0	Reported Reported SERED (NOWN Reported
F33 NW 1/4 - 1/2 Mile Lower			IA WELLS	IAPU40000215076
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of 42135 50 Drilling method: Augured; Known wel	Well Type: Construction/Permit Date		s registered for testing າ
F34 NW 1/4 - 1/2 Mile Lower			IA WELLS	IAPU40000300384
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of 6090 85 Well plugged: 9/2/1992; Well type: <	Well Type: Construction/Permit Date		istered abandoned wells

Map ID Direction				
Distance Elevation		Da	tabase	EDR ID Number
G35 WSW 1/2 - 1 Mile Lower		A	WELLS	IAPU40000300368
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the S 26831 60 Well plugged: 8/5/1996; Well ty	Well Type: Construction/Permit Date:	Regi n.a.	stered abandoned wells
G36 WSW 1/2 - 1 Mile Lower		AI	WELLS	IAPU40000300370
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the S 26147 60 Well plugged: 8/5/1996; Well ty	Well Type: Construction/Permit Date:	Regi n.a.	stered abandoned wells
H37 SSE 1/2 - 1 Mile Lower		A	WELLS	IAPU40000215291
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the S 42341 unkn Drilling method: Drilled; Well de	Well Type: Construction/Permit Date:	Well	s registered for testing
H38 SSE 1/2 - 1 Mile Lower		AI	WELLS	IAPR40000042340
Database: Depth Reliability: Sample Date: Sampling Location: Bacteria Results: Safe/Unsafe Nitrate Level: Nitrate Remarks: Method Accuracy: Material Accuracy: Diameter Accuracy: Year Accuracy:	Private Wells Tested U 06-MAY-91 KITCHEN SINK 0 S Not Reported Not Reported Not Reported K U	Well Depth: Private Permit #: Analysis Date: Safe/Unsafe Bacteria Level: Bacteria Remarks: Nitrate Results: Construction Method: Casing Material: Casing Diameter: Year Constructed: Agent:	07-M S Not I 4 DRIL STE 8 0	Reported IAY-91 Reported LLED EL E GOTTSCHE

Map ID Direction					
Distance Elevation			Databa	se	EDR ID Number
l39 WSW 1/2 - 1 Mile Lower			IA WELI	LS	IAPW4000068261
Database: PWTS Well #: Tier #: Elevation: Total Well Depth: Depth to Water: Driller: Remarks: Well Status: Permitted Private Well: Renovated Well:	Private Well Tracking System Wells 2131090 99 0 287 277 Middendorff Well Co. Not Reported Plugged Not Reported Not Reported Not Reported	Permit #: Range #: Elevation Accuracy: Bedrock Depth: Well Finished: Construction Method: Well Use: Heat Pump Wells: Abandoned Well: Registered for Tests:		36 Not R 0 28-SE Rotar House 0 X	y Drill
l40 WSW 1/2 - 1 Mile Lower			IA WELI	LS	IAPU4000082553
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State o 2127324 unkn Status: Permitted	f Iowa Well Type: Construction/Permit Date	:	Privat unkn	e well tracking system
l41 WSW 1/2 - 1 Mile Lower			IA WELI	LS	IAPU4000003575
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State o 63913 178 Bedrock depth: 0; Well type: Heat Pu	Well Type: Construction/Permit Date	:	IGS w 6/20/2	vell database 2007
l42 WSW 1/2 - 1 Mile Lower			IA WELI	LS	IAPW40000048635
Database: PWTS Well #: Tier #: Elevation: Total Well Depth: Depth to Water: Driller: Remarks: Well Status: Permitted Private Well: Renovated Well:	Private Well Tracking System Wells 2127324 99 0 0 Not Reported Not Reported Permitted X Not Reported	Permit #: Range #: Elevation Accuracy: Bedrock Depth: Well Finished: Construction Method: Well Use: Heat Pump Wells: Abandoned Well: Registered for Tests:		0 Not R Not R Heat 3 Not R	eported eported eported

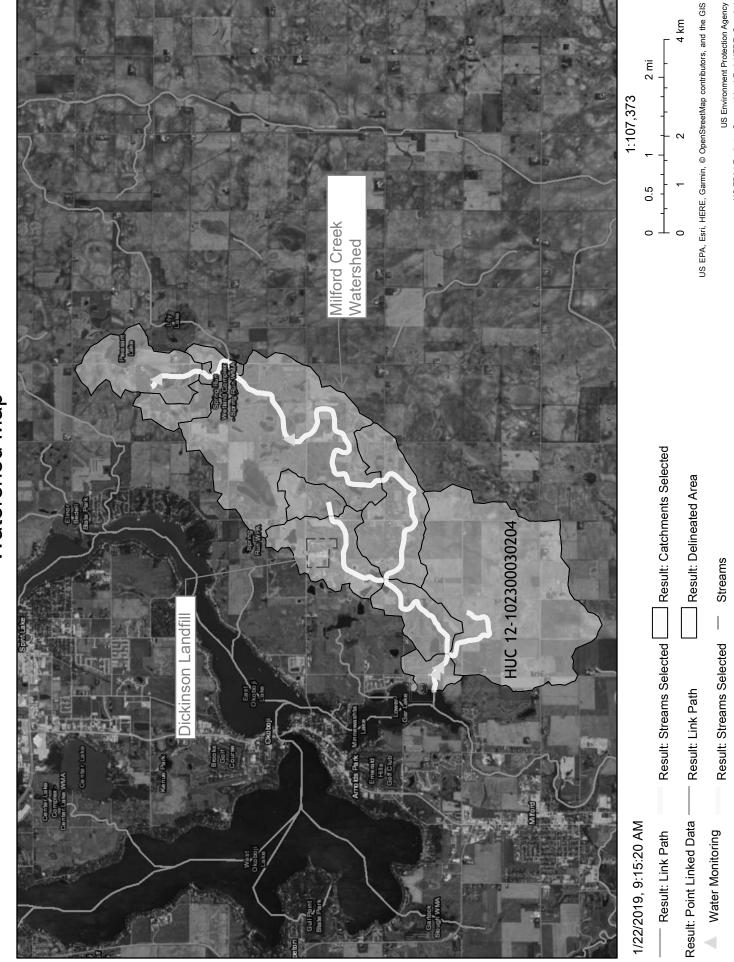
Map ID Direction Distance Elevation			Database	EDR ID Number
l43 WSW 1/2 - 1 Mile Lower			IA WELLS	IAPU4000082554
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of 2127895 unkn Status: Permitted	[:] Iowa Well Type: Construction/Permit Date		ate well tracking system n
l44 WSW 1/2 - 1 Mile Lower			IA WELLS	IAPW4000063997
Database: PWTS Well #: Tier #: Elevation: Total Well Depth: Depth to Water: Driller: Remarks: Well Status: Permitted Private Well: Renovated Well:	Private Well Tracking System Wells 2127895 99 0 0 Not Reported Not Reported Permitted X Not Reported	Permit #: Range #: Elevation Accuracy: Bedrock Depth: Well Finished: Construction Method: Well Use: Heat Pump Wells: Abandoned Well: Registered for Tests:	0 Not Hou 0 Not	74 Reported Reported sehold, Irrigation Reported Reported
45 WSW 1/2 - 1 Mile Lower			IA WELLS	IAPU4000082563
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of 2131090 287 Status: Plugged	[:] Iowa Well Type: Construction/Permit Date		ate well tracking system 8/2007
J46 West 1/2 - 1 Mile Higher			IA WELLS	IAPU4000082534
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State of 2076560 55 Status: Active	[:] Iowa Well Type: Construction/Permit Date		ate well tracking system /4/2001

Map ID Direction Distance				
Elevation			Database	EDR ID Number
J47 West 1/2 - 1 Mile Higher			IA WELLS	IAPW40000001465
Database: PWTS Well #: Tier #: Elevation: Total Well Depth: Depth to Water: Driller: Remarks: Well Status: Permitted Private Well: Renovated Well:	Private Well Tracking System Wells 2076560 99 0 55 31 Middendorff Well Co. Not Reported Active Not Reported Not Reported Not Reported	Permit #: Range #: Elevation Accuracy: Bedrock Depth: Well Finished: Construction Method: Well Use: Heat Pump Wells: Abandoned Well: Registered for Tests:	36 No 24 Ro Irri 0 No	t Reported t Reported -OCT-01 tary Drill gation t Reported t Reported
J48 West 1/2 - 1 Mile Higher			IA WELLS	IAPU40000003541
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State o 55291 55 Bedrock depth: 0; Well type: Private	f Iowa Well Type: Construction/Permit Date		S well database /24/2001
49 West 1/2 - 1 Mile Lower			IA WELLS	IAPU40000300321
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State o 21887 unkn Well plugged: 11/13/1995; Well type:	Well Type: Construction/Permit Date		gistered abandoned wells
50 SE 1/2 - 1 Mile Lower			IA WELLS	IAPU40000300481
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the State o 4309 50 Well plugged: 10/18/1990; Well type:	Well Type: Construction/Permit Date		gistered abandoned wells

Map ID Direction Distance Elevation		Da	itabase	EDR ID Number
51 West 1/2 - 1 Mile Lower		IA	WELLS	IAPU40000300326
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the Sta 4310 72 Well plugged: 10/29/1990; Well t	Well Type: Construction/Permit Date:	Regi n.a.	istered abandoned wells
K52 SSE 1/2 - 1 Mile Lower		IA	WELLS	IAPU40000300465
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the Sta 6078 38 Well plugged: 5/3/1992; Well type	Well Type: Construction/Permit Date:	Regi n.a.	istered abandoned wells
K53 SSE 1/2 - 1 Mile Lower		IA	WELLS	IAPU40000300467
Database: Well ID: Well Depth: Notes:	All Known Water Wells in the Sta 4560 86 Well plugged: 3/26/1991; Well ty	Well Type: Construction/Permit Date:	Regi n.a.	istered abandoned wells

APPENDIX C

Map of Watershed Containing Dickinson Landfill and Drainage to Lower Gar Lake



Watershed Map

US EPA | Earthstar Geographics | Esri, HERE, Garmin |

APPENDIX D

Weekly Waste Disposal Summary Table, BNSF Doon, IA Crude Oil Derailment

Waste Stream	Profile #	Week	Weekly # of Loads	Weekly Volume Disposed (tons)	Total # of Loads	Total Volume Disposed (tons)
Soil impacted with crude oil	102877IA				812	17,570
		July 23- July 27, 2018	16	253.28		
		July 30 - August 3, 2018	21	321.69		
		August 6 - August 10, 2018	2	19.99		
		August 20 - August 24, 2018	49	1,123.99		
		August 27 - August 31, 2018	121	2,543.97		
		September 10 – September 14, 2018	30	613.20		
		October 15 – October 19, 2018	40	772.34		
		October 22 – October 26, 2018	57	1,127.81		
		October 29 – November 2, 2018	60	1,116.17		
		November 26 – November 30, 2018	6	190.02		
		December 3 – December 7, 2018	66	2,272.26		
		December 10 – December 14, 2018	124	2,947.31		
		December 17 – December 21, 2018	103	2,480		
		January 7 – January 11, 2019	81	1,787.97		
Vegetation impacted with crude oil (wood chips and corn)	102875IA				123	1,134.70
		July 16 - July 20, 2018	19	142.32		
		July 23- July 27, 2018	49	418.21		
		July 30 - August 3, 2018	31	256.21		
		August 6 - August 10, 2018	24	317.96		
Vegetation and soil impacted with crude oil	102869IA				108	1,545.79
		July 9 - July 13, 2018	15	224.52		
		July 16 - July 20, 2018	42	531.46		
		July 23- July 27, 2018	3	22.53		
		July 30 - August 3, 2018	32	507.30		
		August 6 - August 10, 2018	14	216.13		
		January 7 – January 11, 2019	2	43.85		
Absorbents and oily debris (includes rail car jackets)	102870IA				46	159.86
		July 9 - July 13, 2018	7	16.38		
		July 16 - July 20, 2018	11	26.94		
		July 23- July 27, 2018	ი ე	40.38		
		July 30 - August 3, 2018	ю	4.00		
		August 6 - August 10, 2018	7	28.11		
		September 24 – September 28, 2018	1	1.47		
		October 1 – October 5, 2018	1	2.11		
		November 26 – November 30, 2018	2	10.92		
		January 14 – January 18, 2019	5	29.55		
Crude Bottoms	102924IA				5	38.36
		November 26 – November 30, 2018	5	38.36		
TOTALS					1,094	20,448.71

Page 1 of 1

Weekly Waste Disposal Summary Table BNSF Doon, IA Crude Oil Derailment

APPENDIX E

Safety Data Sheet for ConocoPhillips SMA (Surmont Mix A)



SMA (Surmont Mix A)

SECTION 1. IDENTIFICATION

Product Identifier	SMA (Surmont Mix A)
Other Means of Identification	Petroleum Crude Oil
Product Family	Crude Oil
Recommended Use Restrictions on Use	Refinery feedstock. None known.
Manufacturer/Supplier Identifier	ConocoPhillips Canada Limited or its Affiliates P.O. Box 130, 401 - 9th Ave. SW Calgary, Alberta T2P 2H7
Emergency Phone No.	Chemtrec, 800-424-9300, (24 hr) CANUTEC, 1-800-CAN-UTEC (226-8832), (24 hr)

SECTION 2. HAZARD IDENTIFICATION

Classification

Flammable liquid - Category 1; Acute toxicity (Oral) - Category 3; Acute toxicity (Dermal) - Category 4; Acute toxicity (Inhalation) - Category 3; Skin irritation - Category 2; Eye irritation - Category 2; Aspiration hazard - Category 1

Label Elements



Signal Word: Danger

Hazard Statement(s):

- H225 Highly flammable liquid and vapour.
- H301 Toxic if swallowed.
- H304 May be fatal if swallowed and enters airways.
- H315 Causes skin irritation.
- H320 Causes eye irritation.
- H335 May cause respiratory irritation.
- H401 Toxic to aquatic life.

Precautionary Statement(s):

- P210 Keep away from heat, sparks, open flames, and hot surfaces. No smoking.
- P233 Keep container tightly closed.
- P240 Ground/bond container and receiving equipment.
- P241 Use explosion-proof electrical, ventilating, lighting, and other equipment.
- P242 Use only non-sparking tools.
- P243 Take precautionary measures against static discharge.
- P261 Avoid breathing vapours.
- P280 Wear protective gloves/protective clothing.



SMA (Surmont Mix A)

Other Hazards

EMERGENCY OVERVIEW :

FLAMMABLE LIQUID AND VAPOUR. May form flammable/explosive vapour-air mixtures. Electrostatic charges may be generated during handling. Electrostatic discharges may cause fire.

General Hygiene Comments :

Do NOT eat, drink or store food in work areas.

Remove contaminated clothing and protective equipment before entering eating areas or leaving work area. Wash hands thoroughly after handling this product and before eating, using the washroom or leaving work area.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	%	Other Identifiers
Crude Oil	8002-05-9	100	Not available
Methane	74-82-8	<0.01	Methyl hydride
Ethane	74-84-0	<0.01	Ethyl hydride
Propane	74-98-6	<0.01	Propyl hydride
Isobutane	75-28-5	0.05 - 0.15	2-methylpropane
n-Butane	106-97-8	0.25 - 0.50	Butyl hydride
Isopentane	78-78-4	0.50 - 1.00	2-methylbutane
n-Pentane	109-66-0	0.50 - 1.00	Pentyl hydride
Hexanes	110-54-3	1.00 - 1.50	Not available
Heptanes	142-82-5	1.25 - 1.75	Not available
Octanes	111-65-9	1.50 - 2.00	Not available
Nonanes	111-84-2	1.25 - 1.75	Not available
Decanes+	124-18-5	90.00 - 92.00	Not available
Benzene	71-43-2	0.05 - 0.15	Benzol
Toluene	108-88-3	0.10 - 0.50	Methylbenzene
Ethylbenzene	100-41-4	0.05 - 0.15	Phenylethane
Xylene (mixed isomers)	1330-20-7	0.25 - 0.75	1,2/1,3/1,4-dimethylbenzene
Hydrogen Sulfide	7783-06-4	Not detected	Sulfur hydride, acid gas

Notes

Concentrations are expressed in % weight/weight. May contain trace amounts of hydrogen sulfide.

SECTION 4. FIRST-AID MEASURES

First-aid Measures

Inhalation

Take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). Move to fresh air. Keep at rest in a position comfortable for breathing. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by Poison Centre or doctor. If the victim has difficulty breathing or tightness in the chest, is dizzy, vomiting, or unresponsive, administer oxygen with rescue breathing or CPR as required. Obtain medical attention immediately.



SMA (Surmont Mix A)

Skin Contact

Avoid direct contact. Wear chemical protective clothing if necessary. Take off contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Immediately wash gently and thoroughly with lukewarm, gently flowing water and mild soap for 15-20 minutes.

Eye Contact

Immediately rinse the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open. If eye irritation persists, get medical advice or attention.

Ingestion

Rinse mouth with water. Immediately call a Poison Centre or doctor. Do not induce vomiting.

Most Important Symptoms and Effects, Acute and Delayed

If inhaled:

Can irritate the nose and throat. Symptoms may include headache, nausea, dizziness, drowsiness and confusion.

If in eyes:

May cause moderate to severe irritation. Symptoms include sore, red eyes, and tearing.

If swallowed:

Small amounts can irritate the mouth, throat and stomach.

May be drawn into the lungs if swallowed or vomited, causing severe lung damage. Death can result.

Immediate Medical Attention and Special Treatment

Special Instructions

Treat symptomatically. Consult a Poison Control Centre for guidance.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Small fire: Carbon dioxide, dry chemical powder, appropriate foam, water spray or fog.

Large fire: Water spray, fog or regular foam. Do not use straight streams.

Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads:

Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.

Cool containers with flooding quantities of water until well after fire is out.

Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

ALWAYS stay away from tanks engulfed in fire.

For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Specific Hazards Arising from the Product

May accumulate in hazardous amounts in low-lying areas especially inside confined spaces, resulting in a fire and/or health hazard.

Special Protective Equipment and Precautions for Fire-fighters

Wear full protective clothing and self-contained breathing apparatus. Fight fire from a safe distance or a protected location. For a massive fire, immediately evacuate the area and use unmanned hose holder or monitor nozzles. Chemical protective clothing (e.g. chemical splash suit) and positive pressure SCBA may be necessary.



SMA (Surmont Mix A)

Unsuitable Extinguishing Media

Do not use water in a stream or jet.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures

Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel. Evacuate downwind locations. Use the personal protective equipment recommended in Section 8 of this safety data sheet. Do not touch damaged containers or spilled product unless wearing appropriate protective equipment. Eliminate all ignition sources. Use grounded, explosion-proof equipment. Before entry, especially into confined areas, check atmosphere with an appropriate monitor.

Environmental Precautions

Do not allow into any sewer, on the ground or into any waterway. If the spill is inside a building, prevent product from entering drains, ventilation systems and confined areas. Minimize the use of water to prevent environmental contamination.

Methods and Materials for Containment and Cleaning Up

Small spills or leaks: stop or reduce leak if safe to do so. Contain and soak up spill with absorbent that does not react with spilled product. Do NOT use combustible materials such as sawdust. Place used absorbent into suitable, covered, labelled containers for disposal.

Large spills or leaks: dike spilled product to prevent runoff. Do not direct water at spill or source. Knock down vapour with fog or fine water spray.

Other Information

Report spills to local health, safety and environmental authorities, as required.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

Prevent uncontrolled release of product. Eliminate heat and ignition sources such as sparks, open flames, hot surfaces and static discharge. Post "No Smoking" signs. Do not use near welding operations or other high energy sources. Do not weld, cut or perform hot work on empty container until all traces of product have been removed. Electrically bond and ground equipment. Ground clips must contact bare metal. Do not carry or transfer this product in an enclosed space (e.g. in an elevator or inside a vehicle). Wear personal protective equipment to avoid direct contact with this chemical. Do not puncture or incinerate container even when empty.

Conditions for Safe Storage

Store in an area that is: cool, temperature-controlled, well-ventilated, separate from incompatible materials (see Section 10: Stability and Reactivity), clear of combustible and flammable materials (e.g. old rags, cardboard), out of direct sunlight and away from heat and ignition sources.

ConocoPhillips

SMA (Surmont Mix A)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters	ACGIH TLV®		OSHA PEL		AIHA WEEL	
Chemical Name	TWA	STEL	TWA	Ceiling	8-hr TWA	TWA
Methane	Not					
	established					
Ethane	Not					
	established					
Propane	1000 ppm					
Isobutane		1000 ppm				
n-Butane		1000 ppm	800 ppm			
Isopentane	600 ppm					
n-Pentane	600 ppm		1000 ppm			
Hexanes	50 ppm Skin		500 ppm			
Heptanes	400 ppm	500 ppm	500 ppm			
Octanes	300 ppm		500 ppm			
Nonanes	200 ppm					
Decanes+	Not		Not			
	established		established			
Benzene	0.5 ppm A1	2.5 ppm A1				
	Skin	Skin				
Toluene	20 ppm A4		200 ppm			
Ethylbenzene	100 ppm	125 ppm				
Xylene (mixed isomers)	100 ppm A4	150 ppm A4				
Hydrogen Sulfide	1 ppm	5 ppm		20 ppm		

Appropriate Engineering Controls

Do not allow product to accumulate in the air in work or storage areas, or in confined spaces. Use local exhaust ventilation and enclosure, if necessary, to control amount in the air. If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Individual Protection Measures

Eye/Face Protection

Wear chemical safety goggles.

Skin Protection

Avoid repeated or prolonged skin contact. Wear chemical protective clothing e.g. gloves, aprons, boots.

Respiratory Protection

Not normally required if product is used as directed. Use appropriate OSHA/NIOSH approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Basic Physical and Chemical Properties			
Appearance	Brown - black liquid.		
Odour	Hydrocarbon, possibly faint rotten egg smell		
Odour Threshold	Not available		
рН	Not applicable		



Melting Point/Freezing Point Initial Boiling Point/Range Flash Point **Evaporation Rate** Flammability (solid, gas) **Upper/Lower Flammability or Explosive Limit** Vapour Pressure Vapour Density (air = 1) Relative Density (water = 1) Solubility Partition Coefficient, n-Octanol/Water (Log Kow) **Auto-ignition Temperature Decomposition Temperature** Viscosity

Other Information Physical State Molecular Formula Molecular Weight

SMA (Surmont Mix A)

Not available (melting); Not available (freezing) 28 °C -16 °C (closed cup) Not available Not applicable (liquid). Not available (upper); Not available (lower)

28.6 kPa at 37.8°C (100°F) > 1 (estimated) 0.940 - 0.942 at 15 °C Practically insoluble in water; Highly soluble in common organic solvents. Not available

Not available Not available 86.71 centistokes at 40 °C (104 °F) (kinematic)

Liquid Not available Not available

SECTION 10. STABILITY AND REACTIVITY

Reactivity

Not reactive under normal conditions of use.

Chemical Stability

Normally stable.

Possibility of Hazardous Reactions

Not sensitive to mechanical impact.

Conditions to Avoid

Heat. High temperatures. Open flames, sparks, static discharge, heat and other ignition sources. Incompatible materials.

Incompatible Materials

Strong oxidizing agents (e.g. perchloric acid).

Hazardous Decomposition Products

Combustion releases carbon dioxide, trace amounts of sulfur oxides, and nitrogen oxides. A lack of oxygen during combustion can produce carbon monoxide and other toxic and flammable products. Hazardous decomposition products are not expected to form during normal storage.

SECTION 11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

Inhalation; skin contact; eye contact; ingestion.

Product Identifier:	SMA (Surmont Mix A)
Date of Preparation:	September 26, 2017
Date of Last Revision:	September 26, 2017

Safety Data Sheet



SMA (Surmont Mix A)

Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Methane	Not available	Not available	Not applicable
Ethane	Not available	Not available	Not available
Propane	> 800000 ppm (rat)	Not applicable	Not applicable
	(30-minute exposure)		
Isobutane	368000 mg/kg (male	> 5000 mg/kg	> 5000 mg/kg
	mouse) (4-hour exposure)		
	(vapour)		
n-Butane	658 mg/L (rat) (4-hour	Not available	Not available
	exposure)		
Isopentane	140000 ppm (mouse)	> 2000 mg/kg (rat)	Not available
	(2-hour exposure) (vapour)		
n-Pentane	6106 ppm (rat) (4-hour	> 2000 mg/kg (rat)	Not available
	exposure)		
Hexanes	73680 ppm (rat) (4-hour	32290 mg/kg (male rat)	> 3295 mg/kg (rabbit)
	exposure) (vapour)		
Heptanes	~ 25000 ppm (rat) (4-hour	> 15000 mg/kg (rat)	Not available
	exposure)		
Octanes	25250 ppm (rat) (4-hour	Not available	Not available
	exposure)		
Nonanes	3200 ppm (rat) (4-hour	> 15000 mg/kg	Not available
	exposure)		
Decanes+	72300 mg/m3 (mouse)	Not available	Not available
	(2-hour exposure) (aerosol)		
Benzene	13700 ppm (rat) (4-hour	930 mg/kg (rat)	> 8240 mg/kg (rabbit)
	exposure)		
Toluene	7585 ppm (rat) (4-hour	5580 mg/kg (male rat)	12125 mg/kg (rabbit)
	exposure)		
Ethylbenzene	~ 4000 ppm (rat) (4-hour	3500 mg/kg (rat)	15380 mg/kg (rabbit)
	exposure)		
Xylene (mixed isomers)	6350 ppm (male rat)	3523 mg/kg (rat)	> 1700 mg/kg (rabbit)
	(4-hour exposure)		
Hydrogen Sulfide	444 ppm (rat) (4-hour	Not available	Not available
	exposure)		

Skin Corrosion/Irritation

May cause mild irritation based on information for closely related chemicals. Contact may cause irritation to the skin and mucous membranes upon prolonged and/or repeated skin contact. Prolonged or repeated contact to petroleum oil with skin may cause defatting of the skin leading to redness, itching, inflammation, cracking, dermatitis (rash).

Serious Eye Damage/Irritation

May be irritating to eyes. Symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation

Not an expected route of exposure, but vapours may cause irritation of the nose and throat.

Skin Absorption

Liquid may be absorbed through the skin if large areas of skin are exposed.

Product Identifier:	SMA (Surmont Mix A)
Date of Preparation:	September 26, 2017
Date of Last Revision:	September 26, 2017



SMA (Surmont Mix A)

Ingestion

May cause gastrointestinal irritation. Symptoms may include abdominal pain, stomach upset, nausea, vomiting, and diarrhea.

If small amounts are ingested: can irritate the mouth, throat and stomach.

If large amounts are ingested: harmful.

Aspiration Hazard

May be drawn into the lungs (aspirated) if swallowed or vomited.

STOT (Specific Target Organ Toxicity) - Repeated Exposure

Material in general is not expected to cause harm.

Respiratory and/or Skin Sensitization

Not a respiratory sensitizer. Not a skin sensitizer.

Carcinogenicity

Chemical Name	IARC	ACGIH®	NTP	OSHA
Benzene	Group 1	A1	Known carcinogen	Carcinogen
T I () I () ()				

The material in general is not considered a carcinogen, however, all appropriate precautions should still be taken due to the presence of benzene in the product.

Reproductive Toxicity

Development of Offspring

Material in general is not expected to cause harm. The material in general is not expected to produce teratogenic or embryotoxic effects.

Sexual Function and Fertility

Material in general is not expected to cause harm. The material in general is not expected to have toxic reproductive effects.

Effects on or via Lactation

No information was located.

Germ Cell Mutagenicity

Material in general is not expected to cause harm. The material in general is not expected to produce mutagenic effects

Interactive Effects

No information was located.

Ecotoxicity

Harmful to aquatic life, animals, birds.

Persistence and Degradability

Not expected to be removed rapidly from aquatic environments by evaporation.

SECTION 12. ECOLOGICAL INFORMATION

Bioaccumulative Potential

This product and its degradation products are not expected to bioaccumulate.

Product Identifier:	SMA (Surmont Mix A)
Date of Preparation:	September 26, 2017
Date of Last Revision:	September 26, 2017



SMA (Surmont Mix A)

Mobility in Soil

If released into the environment, this product is expected to move slowly through the soil, based on physical and chemical properties. Contamination of groundwater could occur. If released into soil, this material will absorb and may biodegrade in anaerobic conditions. In water it may become volatile. Photo-oxidation products may include phenol, nitrophenols, nitrobenzene, formic acid.

Other Adverse Effects

There is no information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods

Material Disposal:

This product and its container must be disposed of as hazardous waste. Do NOT dump into any sewers, on the ground or into any body of water. Do not discharge into areas where there is a risk of forming an explosive mixture with air.

Local Legislation:

Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.

SECTION 14. TRANSPORT INFORMATION

Regulation	UN No.		hipping Name Transport Hazard Class(es)	
Canadian TDG	1267	PETROLEUM CRUDE OIL	3	I
US DOT	1267	PETROLEUM CRUDE OIL	3	I

Environmental Potential Marine Pollutant **Hazards**

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code Not applicable

Emergency Resp(GUIDE 128 Guide No.

SECTION 15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations This section is not required by WHMIS 2015.

SECTION 16. OTHER INFORMATION

NFPA Rating	Health - 3	Flammability - 3	Instability - 0	
SDS Prepared By Phone No.	Maxxam Analytics 1-800-386-7247			
Product Identifier:	SMA (Surmont Mix A)			



SMA (Surmont Mix A)

Date of Preparation Date of Last Revision	September 26, 2017 September 26, 2017
Revision Indicators	Not applicable
Key to Abbreviations	ACGIH® = American Conference of Governmental Industrial Hygienists OSHA = US Occupational Safety and Health Administration RTECS® = Registry of Toxic Effects of Chemical Substances
References	CHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS). Registry of Toxic Effects of Chemical Substances (RTECS®) database. Dassault Systèmes/BIOVIA ("BIOVIA"). Available from Canadian Centre for Occupational Health and Safety (CCOHS).
Disclaimer	This SDS provides safety information and was developed for employees, customers and agents of ConocoPhillips from data obtained from the sample(s) submitted for analysis. The information may not be valid or complete if the product or material is used in combination with other products or materials, or in any process. This information is intended for reasonable normal usage and recommended practices, and to underscore the potential hazards that may be inherent to the nature of the product or material. Although every effort is made to ensure accuracy and completeness of the contained information, it is understood that Maxxam Analytics makes no warranty as to the accuracy or completeness of information and assumes no liability for any damage or loss suffered as result of any inaccuracy or incompleteness therein. This information is considered to be as accurate as possible, as of the date of preparation. The reader is invited to contact ConocoPhillips at the address shown to ensure the information is up to date or to obtain further information related to an unusual or other use.

DS representative sample(s).

ConocoPhillips Crude Blend A1



Product Identifier: Date of Preparation: Date of Last Revision: SMA (Surmont Mix A) September 26, 2017 September 26, 2017 SMA is a crude oil made from a combination of three different oils (hydrocarbon):

- a. Bitumen -- heavy oil, non-reactive, less volatile, heavy product, typical API: 7 to 8
- b. Synthetic Crude Oil (SCO) an upgraded stable product, used as diluent for separation and transportation of bitumen, typical API: 30 to 35
- c. Condensate (C5+) light stabilized condensate, used as diluent for separation and transportation of bitumen, typical API: ~80

The percentage combination of these oils, the individual oil properties and the combined properties are shown in the below table:

			Diluent		Final Product
		Bitumen	sco	Condensate (C5+)	SMA Blend
Vol	%	52	39	9	100
Density @25C	kg/m3	1014	858	675	935
	API	8	33	78	20
Viscosity @25C	сР	400,000	6	0.25	100
Vapour Pressure @25C (ASTM D6377 VPCR					
4:1)	kPaa	Negligible	19	70	28

The combination of bitumen, SCO and condensate in the proportions noted above forms a very miscible and stable crude oil (SMA). Generally, SMA does not dissociate back into its individual oil forms (bitumen, SCO and condensate). SMA is expected to be thick, viscous and sticky in nature around 25C.

During the initial few minutes following the loss of containment, some extremely light hydrocarbons like butanes may have escaped into atmosphere. Beyond the initial release, SMA is less volatile (i.e. it will not generate flash vapours or hydrocarbon vapors from the water surface). Rather, during loss of containment and spills on flowing water, SMA is expected to form a pad or thick layer of oil on the surface and float along with water. The layer of oil that will be floating will potentially have lighter hydrocarbons facing atmosphere and the heavier phase touching water. There could also be an emulsion phase (i.e. combination of oil and water), at the interphase between the SMA and water.

As the product weathers, it may behave differently than conventional crudes. In the case of diluted bitumen, a dense, viscous material with a strong tendency to adhere to surfaces may begin to form as a residue. In some cases, the residues can submerge or sink to the bottom of the water body. Importantly, the density of the residual oil does not necessarily need to reach or exceed the density of the surrounding water for this to occur. The crude oil may combine with particles present in the water column to submerge, and then remain in suspension or sink. Several factors can influence the weathering process including water flow, turbulence, sediment

load, temperature, etc. The turbulent water may also cause the oil to submerge, then resurface when water flow decreases.

We want to ensure BNSF has considered the unique properties of diluted bitumen and is factoring that into its response and clean up planning.

APPENDIX F

Facility Explorer and Maintenance System Report for Dickinson Landfill, Iowa Dept. Natural Resources



Report Error

Help & Instructions

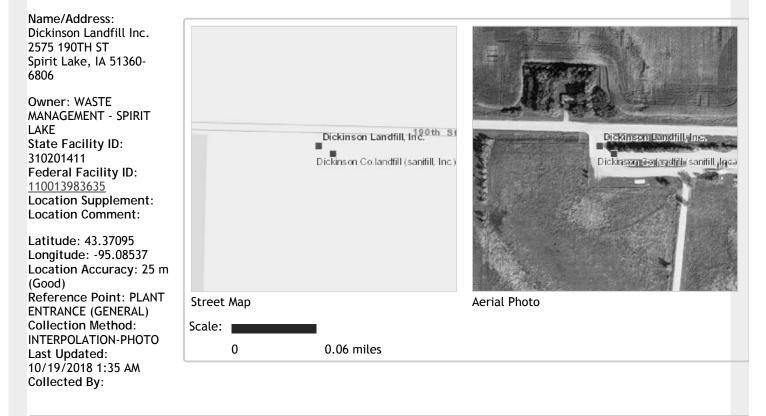
Reports Help & II

Sign In

Go To Map | Print

View Map List View

Facility Details: Dickinson Landfill Inc.



Aliases			
Program	Name	Start Date	End Date
Spills	Handling And Storage Spill	07/24/2009	
Spills	Handling And Storage Spill	07/24/2009	
NPDES General Permit #1-3 - Storm Water	Dickinson County Landfill	08/15/2008	
NPDES General Permit #1-3 - Storm Water	Dickinson Landfill, Inc.	11/30/2010	
NPDES General Permit #1-3 - Storm Water	Dickinson County Landfill Construction Project	10/04/2011	
Tier II Chemical Storage	Dickinson Landfill, Inc	02/18/2009	
Tier II Chemical Storage	Dickinson Landfill Inc	02/18/2009	

Program Information

Emergency Response - Spills

Spill Number	At Facility?	Reported Date	Status	Responsible Party	Mode	Link To Details
073009-BMM-1555	Yes	07/30/2009	Closed	Glenn Stover	Handling And Storage	<u>To Spills Site</u>
092002-JRS-1530	Yes	09/20/2002	Closed	Anonymous	Handling And Storage	<u>To Spills Site</u>
102402-BLW-1011	Yes	10/24/2002	Closed	Stockman Transfer	Handling And Storage	<u>To Spills Site</u>

Wastewater - NPDES General Permit #1-3 - Storm Water

Program ID	Permit Type	Legal Status	Permit Start	Permit End	Link to Details
13823-13613	GP #2 - Construction Activity	Private	6/12/2007	Discontinued	To Stormwater Site
19336-19107	GP #1 - Industrial Activity	Private	11/30/2010	11/30/2020	To Stormwater Site
20835-20604	GP #2 - Construction Activity	Public	10/4/2011	Discontinued	<u>To Stormwater Site</u>

Air - Minor

Plant #	Requirement	Туре	Permit Status	Permit Issued	Permit Expiration	Link to Details
30-01-017	Construction Permit	Construction	Final	02/08/2011		<u>To Permit List</u>

Emergency Response - Tier II Chemical Storage

Tier II ID	Extremely Hazardous Substance	Health Hazard	Flammability Hazard	Reactivity Hazard
FAIDSIT2A00002621	No	No	Yes	No

Solid Waste - Municipal Landfills

Permit Number	Permit Type	Permit Status	Expiration Date	Project Officer	Link To Details
30-SDP-01-75	Municipal Landfill	Active	03/21/2021	Smith	To SW Site

Industrial Codes

No SIC Information for this site. No NAICS Information for this site.

Compliance Links

<u>Field Office Compliance Summary</u> <u>EPA Enforcement and Compliance History Online (ECHO)</u>

Enforcement Action

No Enforcement Action Information for this site.

Features

No Feature Information for this site.

DNR Home | Site Policy | 3.3.1.1260

Leading lowans in caring for our natural resources.

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APPENDIX G

Facility Snapshot Report, Dickinson Landfill, February 15, 2019, Iowa Dept. Natural Resources

SOLID WASTE PERMITTING

Facility Snapshot

Basic Permit Information

Permit Number:	30-SDP-01-75
Permit Name:	Dickinson Landfill Inc.
Expiration Date:	3/21/2021
Project Officer:	Smith
State Facility ID:	310201411
Field Office Compliance Summary:	Visit Field Office Compliance Database
Planning Area:	Dickinson County Sanitary Landfill (Dickinson)
County:	Dickinson
Legal Description:	
Field Office:	3
Permit Status:	Operation Permit
Permit Type:	Municipal Landfill

Last Permit Issuance

			ID	Date	Туре	
				78170	9/30/2013	Initial Receipt
			79149	1/16/2014	Comment Letter Sent	
			80006	4/2/2014	Response Received	
			80616	6/27/2014	Comment Letter Sent	
			81763	11/5/2014	Response Received	
			83111	4/21/2015	Comment Letter Sent	
			84216	9/11/2015	Comment Letter Sent	
Permit Renewal Application	3/21/2016	Approval Letter Sent	84312	9/24/2015	Meeting/Conference Ca	
	- second second		84554	10/19/2015	Response Received	
			84555	10/28/2015	Response Received	
			84689	11/12/2015	Response Received	
			85322	1/11/2016	Response Received	
			85350	2/9/2016	Comment Letter Sent	
			85408	2/16/2016	Public Notice Posted	
			85714	3/21/2016	Response Received	
			85715	3/21/2016	Approval Letter Sent	

Amendments Since Last Permit Issuance

lumbe	гТуре	Last Action Da	teAction Description	Documents			
wetlan	Plan Revisions - design plans	3/23/2018	Reviewed with no action require	ID Date Type 84408 10/12/2015 Comment Letter S 84814 11/25/2015 Comment Letter S 84937 12/8/2015 Response Receiv 85752 3/23/2016 Response Receiv			
monito	General Reporting/Administrative Requirements	7/25/2016	Reviewed with no action require	ID Date Type			
discha	Plan Revisions - leachate control plan	12/12/2017	Comment Letter Sent	ID Date Type 9106912/12/2017 Comment Letter S			
closur	Plan Revisions - closure/post-closure plan	2/27/2018	Comment Letter Sent	ID Date Type 86299 5/11/2016 Initial Receipt 86408 5/31/2016 Comment Letter Se 88424 2/8/2017 Response Receive 88558 3/1/2017 Comment Letter Se 91626 2/27/2018 Comment Letter Se			
well	Plan Revisions - monitoring well maintenance and p	3/7/2018	Comment Letter Sent	ID Date Type 917023/5/2018Initial Receipt			
weil	Plan Revisions - monitoring well maintenance and p	6/18/2018	Approval Letter Sent	ID Date Type 925466/4/2018Initial Receipt 925816/4/2018Initial Receipt			
PCS Va	Variance	6/27/2018	Approval Letter Sent	ID Date Type 926796/26/2018 Initial Receipt			
ETCove	Waste Cover Material	12/18/2018	Approval Letter Sent	ID Date Type 9397812/14/2018 Initial Receipt 9400012/18/2018 Approval Letter Set			
ETCove	Waste Cover Material	12/18/2018	Approval Letter Sent	ID Date Type 9397812/14/2018 Initial Receipt 9400012/18/2018 Approval Letter Set			

Туре	CommentsL	ast Action Dat	eAction Description	n Docum	ents	
			7	ID	Date	Туре
Financial Assurance	2016	10/13/2016	Approval Letter Sent	85888	4/1/2016	Initial Receipt
	0.534044		ICMUP STORESTING SPECIAL	87382	10/13/2010	Approval Letter Sen
Financial Assurance			Approval Letter Sent	ID	Date	Туре
	2015	10/13/2016		82902	4/1/2015	Initial Receipt
				87383	10/13/2010	Approval Letter Sent
Financial Assurance				ID	Date	Туре
	2017	9/13/2017	Approval Letter Sent	8884	03/28/2017	
			0.654	9029	99/13/2017	Approval Letter Sent
			3	ID	Date	Туре
Financial Assurance	2018	5/7/2018	Approval Letter Sent	9201	54/2/2018	Initial Receipt
h. Al				9228	55/7/2018	Approval Letter Sent
				ID	Date	Туре
				87896	12/8/2016	
				87897	12/13/2010	Approval Letter Sent
Permit Revised	revised permit	12/18/2018	Approval Letter Sent	91927	3/28/2018	Approval Letter Sent
				92580	6/18/2018	Approval Letter Sent
				92700	6/27/2018	Approval Letter Sent
						Approval Letter Sent



📽 Services 🏛 Agencies 🛛 📽 Social

Reports∨

	1		1	ID Date Type
				87291 9/23/2016 Initial Receipt
Special Water Quality Report	monitoring	1/3/2017	Reviewed with no action required	87832 11/30/2016 Meeting/Conference Call
				8808912/24/2016 Response Receive
Field Office Inspection Report		10/24/2016	Reviewed with no action required	ID Date Type 8744810/13/2016Initial Receipt
	1			ID Date Type
				883021/30/2017 Initial Receipt
				884602/16/2017 Comment Letter Ser
Annual Water Quality Report,Leachate Performance Evaluation Report,Gas Monitoring Report,Monitoring System Evaluation Report	2016	9/12/2017	Meeting/Conference Call	886783/14/2017 Response Received
womoning report, womoning system Evaluation report			2324	891164/17/2017 Comment Letter Ser
				902939/12/2017 Meeting/Conference Call
	10000		2. 12. 2.	ID Date Type
Special Water Quality Report	holding pond	4/17/2017	Comment Letter Sent	884712/16/2017 Initial Receipt
	510762302	ALC: 120325	91. TO - 9 -	ID Date Type
Semi-Annual Water Quality Report	Spring 2017	7/17/2017	Comment Letter Sent	899487/17/2017 Comment Letter Ser
Semi-Annual Water Quality Report	Fall 2017	8/29/2017	Reviewed with no action required	ID Date Type 902018/22/2017 Initial Receipt
Field Office Inspection Report		11/30/2017	Reviewed with no action required	ID Date Type 9090911/6/2017 Initial Receipt
Semi-Annual Water Quality Report	update	1/16/2018	Reviewed with no action required	ID Date Type 912861/15/2018Initial Receipt
Annual Water Quality Report,Gas Monitoring Report,Leachate Performance Evaluation Report,Monitoring System Evaluation Report	2017	3/7/2018	Comment Letter Sent	ID Date Type 91400 1/31/2018 Initial Receipt 91713 3/7/2018 Comment Letter Set
Special Water Quality Report	MW37A	9/10/2018	Reviewed with no action required	ID Date Type 931469/7/2018Initial Receipt
Semi-Annual Water Quality Report	Fall 2018	9/12/2018	Reviewed with no action required	ID Date Type 931478/28/2018 Initial Receipt
Field Office Inspection Report		10/25/2018	Reviewed with no action required	ID Date Type 9355110/9/2018 Initial Receipt
Annual Water Quality Report Gas Monitoring Report Leachate Performance Evaluation Report Monitoring System Evaluation Report	2018	2/14/2019	Comment Letter Sent	ID Date Type 94311 1/31/2019 Initial Receipt 94390 2/14/2019 Comment Letter Set

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APPENDIX H

Sanitary Disposal Project Inspection Report, October 17, 2018, Iowa Dept. Natural Resources



ACTING DIRECTOR BRUCE TRAUTMAN

October 17, 2018

Con 12-1-1 Doc # 93551

Mark Mathis, Landfill Operations Manager Waste Management, Inc. 2575 190th Street Spirit Lake, IA 51360

SUBJECT:Sanitary Disposal Project InspectionSDP Permit #30-SDP-01-75PDickinson County

Dear Mr. Mathis:

Enclosed is a copy of the report resulting from the October 9, 2018 inspection of the Dickinson Landfill near Spirit Lake, IA. The report is believed to be self-explanatory.

If you have any questions or comments, please contact me.

Sincerely

Bryon Whiting, Environmental Specialist Senior Bryon.Whiting@dnr.iowa.gov Field Service and Compliance Bureau

BW:lw

c: -Debra McDonald, P.E., Waste Management, Inc., 3101 West Superior Street, Duluth, MN 55806
 -Blair Nelson, Waste Management, Inc., 12755 137th Street, Glencoe, MN 55336
 -Becky Jolly, PP&ES, E&WMB, ESD, DNR, Des Moines

enc: -Inspection report

sw18/30di1017-ins.docx

IOWA DEPARTMENT OF NATURAL RESOURCES Sanitary Disposal Project Inspection										
Per	mit #	30-SDI	2-1-75	59						Page 2
		acility		Dickinson Landfill, Inc.	nogor			C	ounty:	Dickinson
Dee			lress :	2575 190th Street, Spirit Lake, IA 5				P	hone:	712/336-2700
Responsible Authority: Responsible Official: Address:			fficial:	Debra McDonald, P.E., District Engi		806		P	hone:	641/592-9182
Date This Inspection: 10/9/18 Date Last Inspection: 11/6/17				11/6/17			Wa	ste An	nount:	~150 Tons per day
•	facility personnel present: Blair Nelson and Mark Mathi				surfa ambi	ce cor ent ter	nperat	s: Wet ure: 4	6 F	t 2 mph
• 1				• ontinue in Phase Cell C and Phase	wind	anecu	on and	i speed	J. NE a	it 3 mph
				Yes – compliance was being achieved; No N/A – not applicable or not observed; PN						
Voc	No	N/A	PND	I. Documents and I Item	Record I Yes	Keepin No	g: N/A	PNE	`	ltem
Yes X				1. Permit and Plans	\boxtimes				5. Stor	rm Water Permit
				 Permit Amendments Permit Special Provisions 						P, LCP, HMSP, CPCP
				4. Permit Required Reports a. quarterly solid waste report	X X X				8. Lea 9. LCS	chate volume record
\boxtimes				b. water quality monitoring report c. semi-annual engineer's report						VA & SWAC nancial Assurance
				d. gas monitoring report e. other		Ξ			12. Ot	
Vac	No	N1/A		II. Operating F			N/A	PND		ltem
Yes	<u>No</u>	N/A	PND	Item 1. Fill Cover	Yes					ecial Waste Handling
				a. daily b. intermediate (7-day)						cycling Activities venging & Vector Control
				c. final (60-day) 2. Fill Elevations (adequate surveying)						ter Control fences
		_		3. Control of Face a. width		Ξ			b. 11. Sta	hand picking
				b. slope					a.	operators/personnel
\boxtimes				c. dumping location 4. Compaction					C.	incoming waste operator certification
				5. Drainage a. cover erosion						uipment operation/ maintenance
				b. ponding c. drainage structures					b.	backup availability ad Adequacy
				1. dikes, berms & terraces					14. Mo	onitoring Wells
				2. tile lines 3. ditches					16. Or	lverse Weather Operations
				6. Leachate Control a. system operation					b.	perimeter fence/gate signs
				b. head measuring device operation c. seepage					с. 17. Ot	separation distances her
AUT	HENTI	CATIO	N							
	SPECT			e: Bryon Whiting					Date:	October 17, 2018
				1 Sign Whitney						
RI	EVIEN	ÆR	Name	e: Ken Hesseniuş	·				Date:	October 17, 2018
				Ken Keneniur						

Dickinson Landfill Permit #: 30-SDP-01-75P

<u>General Description</u>: A municipal and commercial solid waste (including construction and demolition waste) Subtitle D sanitary landfill disposal project located at 2575 190th Street near Spirit Lake, IA.

I. <u>Record Keeping</u>:

- 1. **Permit and Plans** The current landfill operation permit was issued on March 21, 2016 and will expire on March 21, 2021.
- Permit Amendments At present, there are no amendments to the current operation permit that was issued on March 21, 2016. However, the current operation permit issued on March 21, 2016 (docDNR #85715) was revised on: December 13, 2016 (docDNR #87897), on March 28, 2018 (docDNR #91927), on June 18, 2018 (docDNR #92580), and also on June 27, 2018 (docDNR #92700).
- 3. **Permit Special Provisions** The comprehensive planning area for this facility includes the cities and unincorporated areas of Dickinson County, excluding the cities of Superior and Terril; and Waste Management of Southern Minnesota, Rock County and Martin County MN. The comprehensive plan was last approved by department on November 9, 2015. The comprehensive plan is renewed every five years and the next updated submittal is due September 1, 2020.
- 4. Permit Required Reports: a. quarterly solid waste report; b. water quality monitoring report; c. semiannual engineer's report; d. gas monitoring report; e. other — The 2017 Annual Monitoring Report (AMR) prepared by Wenck Associates of Maple Plain, MN dated January 29, 2018 (docDNR #91400) included gas monitoring, Nation Pollution Discharge Elimination System (NPDES) storm water monitoring, Leachate Control System Performance Evaluation (LCSPE), surface and ground water monitoring, etc, along with analysis and evaluation. The 2017 ARM was reviewed and commented on in a letter dated March 7, 2018 (docDNR #91713) from Michael Smith. In the Sampling Summary paragraph of his letter, Mr. Smith letter approved monitoring for certain background monitoring wells, detection monitoring points, and monitoring well that are in assessment monitoring. Mr. Smith also advised that, pursuant to Special Provision X.4. of their current permit, the monitoring wells that are in the assessment monitoring can be tested for Appendix II parameters on a five year frequency since two full Appendix II monitoring sets have been completed with the first sampling completed in May of 2011 and the second sampling completed in June of 2016.
- Storm Water Permit General Permit #1 for "Storm Water Discharge Associated with Industrial Activity" under SIC #4953 was issued on November 30, 2010. This storm water General Permit #1 (19336-19107) provides coverage for discharges through November 30, 2020. There were no apparent storm water violations at this facility during this visit.
- 6. Emergency Response and Remedial Action Plan The ERRAP dated September 30, 2013 was approved by the department and incorporated in Special Provision #2.c. of the current operation permit.

7. Development & Operation Plan, Leachate Control Plan, Hydrologic Monitoring System Plan, Closure Post Closure Plan — The Revised Development Plan for this facility is dated March 12, 2009 and approved by the department on August 7, 2009, is incorporated as an operating condition in Special Provision #2 of the current landfill operation permit. The Leachate Control Plan shall be operated in conformance with provisions specified in Special Provision #2.b. of the current landfill operation permit. The liner and leachate control system for the disposal of municipal solid waste (MSW) in future cells shall be in conformance with the provisions contained in Special Provision #3 of the current landfill operation permit. Hydrologic monitoring at this site shall be conducted in accordance with Rule 567 IAC 113.10(455B) and Special Provision #4 of the current landfill operation permit. This landfill shall close in conformance to the Closure Post Closure Plan (CPCP) and other specified conditions provided in Special Provision #15 of the current landfill operation permit.

- 8. Leachate Volume Record Megan Smith provided records of leachate hauled off-site for treatment and disposal from documentation that is kept at the scale house. These records show for a period of January 1, 2018 through October 15, 2018, a total of 2,102,415 gallons of leachate were removed and treated at the Spencer Municipal Wastewater Treatment Plant under the current treatment agreement.
- 9. Leachate Control System Performance Evaluation The LCSPE was included in the 2017 AMR.
- 10. Special Waste Authorization & Special Waste Acceptance Criteria A data base and paper files of special waste profiles are maintained at this landfill. At present, there are reportedly 36 active entities approved by this facility to dispose of waste that has special waste handling needs at this landfill project. Also at present, records in Field Office #3 indicate this facility has one Special Waste Authorization (SWA #30-SWA-11-18 expires on December 27, 2018) that was issued by Susan Johnson on September 27, 2018 for the immediate disposal of approximately 1,000,000 pounds of mixed waste including televisions, monitors, computers, and other electronic waste with dirt, wood, cardboard, broken CRT glass, and other debris. This waste disposal must also follow the EPA Consent Agreement and Final Order, Docket No. RCRA-07-2018-0248, dated July 17, 2018. This waste was released from the Sioux City Planning Area.
- 11. Financial Assurance The financial assurance requirements for calendar year 2018 were found to be adequate as indicated in an approval letter from Bill Blum dated May 7, 2018.
- 12. Other The DNR has developed a new format for presentation of the Annual Water Quality Report (AWQR) for municipal solid waste landfills starting with the 2018 AWQR. The DNR has posted the new format on the DNR website in the section entitled "Other Resources": http://www.iowadnr.gov/Environmental-Protection/land-Quality/Solid-Waste/Solid-Waste-Permitting. The posted format was written in Excel™ (and was prepared in 2015, therefore it may appear that the start of implementation is earlier than January 1, 2018, but that is not the case) but the DNR does not require the user to use that program for final submittal product. The submittal to the DNR needs to be made in either hard copy or pdf copy form in order to allow the eventual storage of the submittal in our Solid Waste Database.

Monitoring well MW-18A well sealing was proposed as prepared and submitted by Wenck Associates dated March 5, 2018 (docDNR #91702). That well sealing proposal was approved by Michael Smith on March 7, 2018 (docDNR #91713). Mr. Mathis indicated MW-18A was removed and sealed in middle April 2018 by a third party contractor.

A variance request by Waste Management was approved by Alex Moon on June 27, 2018 which resulted in the permit revision (also) on June 27, 2018 (docDNR #92700). That permit revision renumbered and added X.7 to the Special Provision section of the permit, allowing for conditional disposal of untreated petroleum contaminated soils (PCS) at the working face.

II. Operating Procedures:

1. Fill Cover: a. daily; b. intermediate (7-day); c. final (60-day) — Daily and intermediate cover appears to be adequate. There is a very good and diverse plant cover has been established on the (entire) finished eastern slope area of the landfill. Mr. Mathis indicated the eastern slope did not get a cut of grass harvested this summer but indicated a cut would be beneficial to enhance a thicker grass cover. During this inspection it was observed that the construction of the final cover on unlined areas including Phase A1 and portions of Phase A and Phase B side slopes using an Evapotranspiration (ET) alternative cap was nearing completion and the shape looks great. Black dirt was evidence of the completed contours and seeding was observed. It was raining during this inspection date, and it appeared this would enhance the seeding efforts to produce some cover going into the fall growing season. Some of the grass was observed to push through and begin

taking hold. Additionally, there were several energy dissipater structures constructed on let down areas to slow runoff of surface waters in these Phase A slope areas that appeared to be doing an excellent job in minimizing erosion rills thus minimizing maintenance repairs. The northern slope of Phase A included a road the goes the top of Phase A that will also likely be used as a haul road giving access to Phase B and Phase C as filling of these cells becomes more elevated.

- 2. Fill Elevations (adequate surveying): The contour interval maps will be updated in the near future to show finished grades of the 2018 final cover construction project, including existing fill site conditions.
- 3. Control of Face: a. width; b. slope; c. dumping location The working face appears to be well managed. At present, the haul road to the east side of the scale house is being used to access to the working face. This facility continues to provide 20-yard roll off containers for customers that do not have dump box capability. These roll off containers are conveniently located adjacent and to the southeast of the scale house allowing sight monitored by scale house staff.
- 4. Compaction Mr. Nelson indicated the Caterpillar 816 compactor recently had new wheel set and differential lockers upgrades completed. He also indicated these upgrades have improved the efficiency of the inbounds volume of solid waste being disposed of at this facility. During this visit date, I observed no concerns with compaction.
- 5. Drainage: a. cover erosion; b. ponding; c. drainage structures 1. dikes, berms & terraces, 2. tile lines, 3. ditches As a part of the Phase A final cover work project, a new storm water pond with a large energy dissipater structure was constructed. This new storm water control structure is designed to handle surface water runoff from generally the Phase A and other unlined areas on the southeast corner of this landfill project. The sedimentation pond to handle water from the unconstructed disposal units west of constructed Phase C has been significantly enlarged during the Phase A final cover work project of 2018. Overall, the drainage at this landfill project has been significantly improved and the benefits from such efforts is beginning to be realized and will continue as this landfill project continues. Such drainage control efforts are to be commended.
- 6. Leachate Control: a. system operation; b. head measuring device operation; c. seepage The lined leachate lagoon has 1,000,000 gallons of storage capacity. Mr. Mathis indicated leachate continues to be hauled all 12 months of the year. The older (adjacent and to the north) cement lined leachate lagoon was removed and eliminated to make room for the new storm water control structure associated with the 2018 construction project. Also as part of the 2018 construction project, new leachate pumps were installed along with upgrades to leachate control panels.
- 7. Special Waste Handling No comments or concerns.
- 8. Recycling Activities Recycling activity at this landfill project continues to be directed to the Dickinson Recycling Center which is managed by the Dickinson County Landfill Commission. The Dickinson Recycling Center is located just east of Milford on county road A-34 where they handle yard waste, appliances, electronic waste, waste tires, waste oil, anti-freeze, scrap metal, paint, and most household hazardous wastes. Having said that, Special Provision #12, #13, #14 and #15 of the current landfill operation permit allows for conditional handling of these recyclable materials; excluding electronic waste.
- 9. Scavenging & Vector Control No comments or concerns.
- **10.** Litter Control: a. fences; b. hand picking There was portable fencing located adjacent to the working face. There were no litter problems or concerns noted during this visit. This landfill project has a litter picker that is essentially full-time. Litter was under control and given its ongoing litter picking efforts I found the site to be in fine shape during this inspection date. Mr. Mathis indicated litter is picked outside the (adjoining) landfill footprint as necessary regardless whether or not it came from the working face area.

- 11. Staffing: a. operators/personnel; b. incoming waste screening; c. operator certification Mark Mathis became the Landfill Operations Manager at this landfill project effective March 28, 2018. At present, this landfill project has three full-time certified landfill operators (Mark Mathis, Megan Smith and Richard Peterson). Certificates for certified landfill operators are valid for two years and renewal is next due on June 30, 2020.
- **12.** Equipment: a. operation/maintenance; b. backup availability Mr. Mathis reported he has adequate equipment to operate this landfill given the current waste material type and waste volume at this landfill project. At present, this facility has three Caterpillar D-6 dozers, a Caterpillar 816 compactor that weighs 55,000 pounds, a 950 Caterpillar wheel loader, a 320 Caterpillar excavator, a John Deere 2355 farm tractor and a Volvo A-30 haul truck as its main equipment pieces for managing its inbounds waste.
- **13. Road adequacy -** The roads are adequate for current landfill operations. The perimeter road has been regraded and its path slightly changed in some places during the 2018 construction project. As a part of that project, new road base material will be added. Mr. Mathis indicate the contractor was about one day from completing this project, but it is now delayed due to heavy rains experienced during this landfill inspection date.
- **14. Monitoring wells** Groundwater monitoring for this landfill project includes background wells MW-11A, MW-13A, MW-34A, and MW-36A, and down gradient wells MW-12A, MW-19A, MW-21A, MW-23A, MW-37A, MW-38A, MW-39A, MW-40A, and GU-B/GU-C. All monitoring wells have a sign with a related ID number attached. All monitoring wells are protected by post barriers. All monitoring wells are locked to prevent unauthorized access. Mr. Mathis reported that all monitoring wells are in good shape.
- **15.** Adverse weather operations There were no operational concerns regarding adverse weather conditions given the present location of the working face, traffic flow to the working face, and the use of roll off containers for non-dump box type vehicles.
- **16.** On-site facilities: a. perimeter fence/gate; b. signs; c. separation distances No comments or concerns.
- 17. Other The landfill gas collection flare was operational during this inspection date. Mr. Mathis advised that a remote monitoring system has been installed to advise the landfill operator should the flare somehow stop operating. This flare is constructed to close the flare valve, if the flame goes out and the automatic ignition system fails to reignite the flare.

The odor concerns expressed during 2016 have been reportedly virtually non-existent during 2017. There were reported odor concerns in late summer 2018. During this investigation date, odor was not a problem. I believe the odor concerns are related with off venting of gas production associated with biological decomposition activity of disposed solid waste. It is hoped that the 2018 capping project of final cover with related drainage improvement efforts including the establishing of a good stand of vegetative cover on Phase A will help. It is also hoped that continuing efforts to tweak the gas flare disposal system and perhaps installing new gas recovery lines as this landfill project as it progresses vertically and westward over the lined disposal units will also help. Mr. Nelson indicted that the current gas system has increased its collection flows and disposal rate. Mr. Nelson advised that this landfill continues to evaluate the efficiency and capacity of its current gas collection and disposal system.

CONCLUSIONS

This landfill project appears to be operating in substantial compliance with the rules and its operation permit.

APPENDIX I

Field Office Compliance Summary Report for Dickinson Landfill, February 18, 2019, Iowa Dept. Natural Resource

IowaDNR Field Office Compliance							
Quick Search for Prog	gram ID:	G	So <u>State Map</u>		Search	Login	<u>Help</u>
Dickinson Landfill I 2575 190TH ST S Site Detail Complia	Spirit Lake, IA		Dates				FO 3
Site Detail	Clear						Print
	ickinson Landfil	l Inc.		State ID:	310201411		
	575 190TH ST pirit Lake	▼ IA ▼	51360-680	Derived Address: Directions:	No		
Field Office:	ickinson O 3-Spencer	▼ ▼		GIS Accuracy: Location Commer	25 t:		
Sec: Tier: Range:	Select Townsh Select Directio				<u>Site Map</u>		
Program Name	Progr	am ID	Status				
Air Quality - Minor	30-01-		Active				
Emergency Response Spills		9-BMM-1555	Closed				
Emergency Response Spills	e - 09200	2-JRS-1530	Closed				
Emergency Response Spills	e - 10240	2-BLW-1011	Closed				
Misc Tier II Chemie Storage	cal FAIDS	IT2A00002621	Active				
Municipal Landfills - Municipal Landfills	30-SD	P-01-75	Operation Permit				
Storm Water - NPDE General Permit #1-3 Storm Water			Discontinued				
	Storm Water - NPDES 19336 Active General Permit #1-3 -						
Storm Water - NPDES20835ActiveGeneral Permit #1-3 - Storm WaterStorm Water							
Affiliates							
Name		Program		Туре		Start/End Dates	
Debra McDonald		Municipal Land	fills	Engineer		2/15/2007	
Glenn Stover		Spills		Legally R	esponsible Entity		
Stockman Transfe	er	Spills		Legally R	esponsible Entity		

Owner

Owner

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Water

NPDES General Permit #1-3 - Storm

Tier II Chemical Storage

DICKINSON LANDFILL, INC.

JEFF VASSAR

١Ē 11/30/2010

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Address 2:

Start Date: *

End Date:

Email:

City/State/Zip: *

Version 1.11.3765 11/30/2017

Iowa's DNR Field Office Compliance - Site Detail

		11-	II
SWASTE MANAGEMENT	NPDES General Permit #1-3 - Storm	Owner	10/4/2011
WASTE MANAGEMENT - S LAKE		Owner	8/15/2008
BEN EILER	NPDES General Permit #1-3 - Storm Water	Public Contact	10/4/2011
CORY VAN ENGEN	NPDES General Permit #1-3 - Storm Water	Public Contact	8/15/2008
JEFF VASSAR	NPDES General Permit #1-3 - Storm Water	Public Contact	11/30/2010 - 4/20/2017
MEGAN SMITH	NPDES General Permit #1-3 - Storm Water	Public Contact	4/20/2017
MICHAEL WICK	Minor	Public Contact	4/16/2003
BLAIR NELSON	Minor	Regulatory Contact	4/16/2003
DENNIS LEACH	Minor	Regulatory Contact	4/16/2003
JEFF VASSAR	Minor	Regulatory Contact	4/16/2003
TERRY SMITH	Minor	Regulatory Contact	4/16/2003
Affiliate Detail			
Save			
Individual?			
Type: * Affiliate Type -	- ▼		
Organization Name: *		Source:	
Address:			

Iowa Administrative Code Legal State of Iowa Home DNR Home

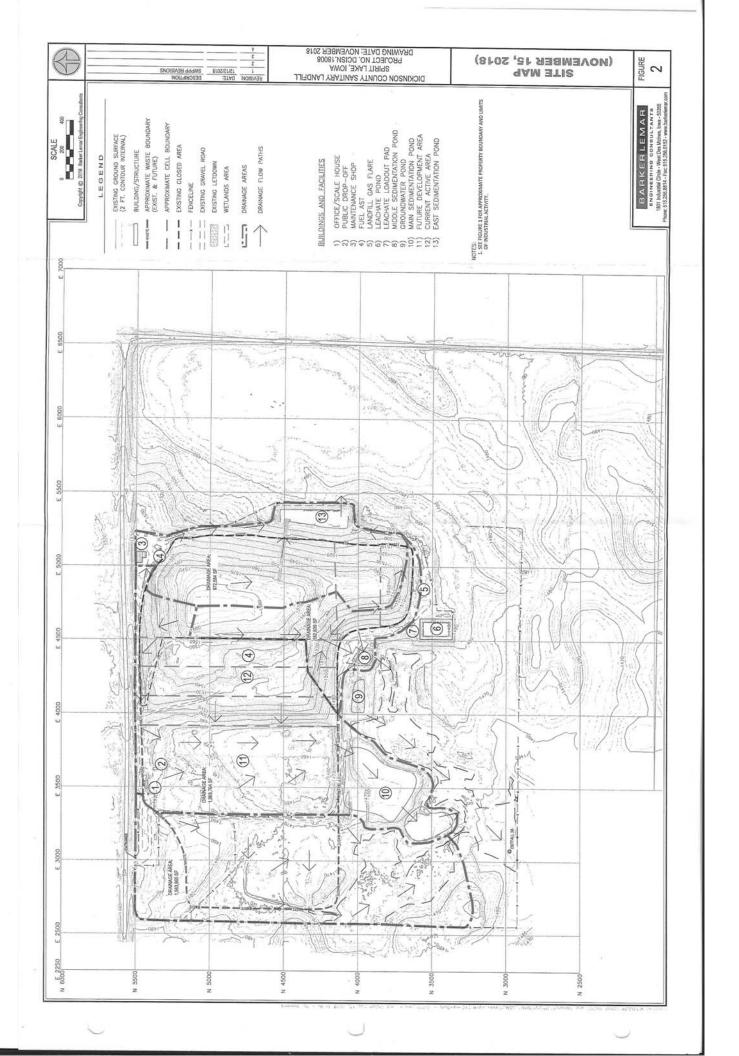
webmaster@dnr.iowa.gov @ Iowa Department of Natural Resources

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Site Policy

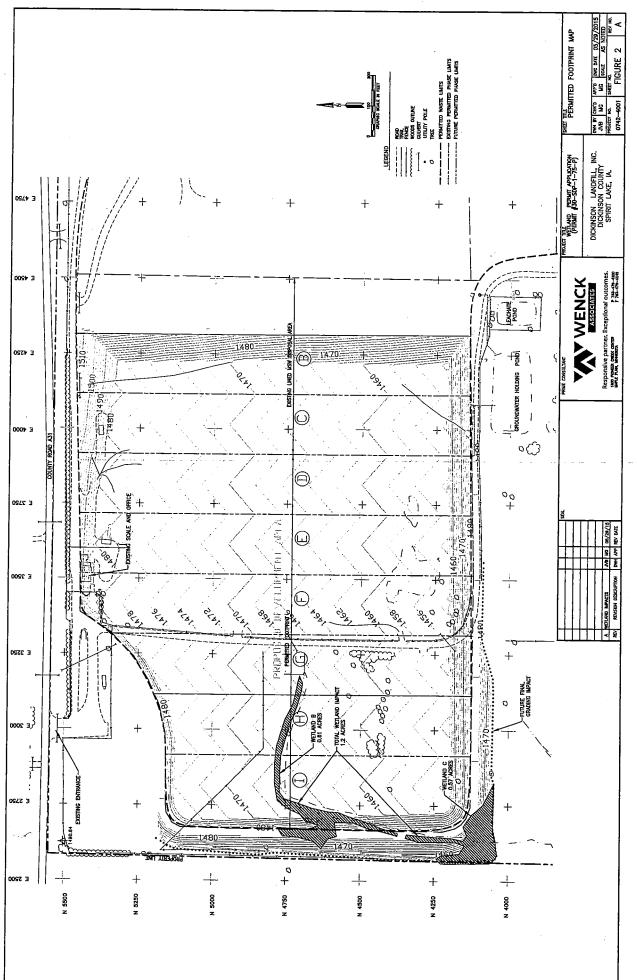
APPENDIX J

Copy of Figure 2 from Stormwater Pollution Prevention Plan, Dickinson Landfill, Updated December 6, 2018



APPENDIX K

Copy of Figure 2 by Wenck Assoc. from December 8, 2016 Dept. of the Army, Corps of Engineers Permit Authorizing Dickinson Landfill to Perform Construction Work (Landfill Expansion) into the 1.2 acres of Onsite Wetlands



M NOV SIDE ANNO 51 ANN 7 ANN 70

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APPENDIX L

Copy of Iowa DNR Air Quality Bureau Construction Permits List and Construction Project Status Report for Dickinson Landfill, February 18, 2019

Sta	ate of Iowa			Down:4 Coorok Doo	. 14	
				Permit Search Res		
	<u>earch by</u> <u>County</u>	Search by City	<u>Search by Pl</u> <u>Name</u> <u>N</u>	ant I <u>Search by</u> Nain Menu		<u>ch by Permit</u> <u>Number</u>
County Name: DICKINSON City Name: SPIRIT LAKE Plant Name: DICKINSON LANDFILL Plant Number: 30-01-017						
(Click the PDF icon on the left side of table below to display the permit image.)						
	lote:					
•	 This may not l Permits issued The images lin 	l prior to 2000 nked from this	may not have page are not a	construction permits been imaged yet. ctual permits. They a maging the actual pe	are renditions of the	-
•	 This may not l Permits issued The images lin 	l prior to 2000 nked from this	may not have page are not a introduced in i	been imaged yet. ctual permits. They a maging the actual pe <u>Equipment</u>	are renditions of the	-
•	 This may not l Permits issued The images lin Some errors m 	l prior to 2000 aked from this hay have been <u>Project</u>	may not have page are not a introduced in i	been imaged yet. ctual permits. They a maging the actual pe	are renditions of the rmit.	e actual permi
•	 This may not I Permits issued The images lin Some errors m Permit Number 	l prior to 2000 aked from this hay have been <u>Project</u> <u>Number</u>	may not have page are not a introduced in i <u>Emission</u> <u>Point</u>	been imaged yet. ctual permits. They a maging the actual pe <u>Equipment</u> <u>Description</u>	are renditions of the rmit.	e actual permi
•	 This may not I Permits issued The images lin Some errors m Permit Number 05-A-645 	l prior to 2000 aked from this hay have been <u>Project</u> <u>Number</u> 05-422	may not have page are not a introduced in i <u>Emission</u> <u>Point</u> EP-05	been imaged yet. ctual permits. They a maging the actual per <u>Equipment</u> <u>Description</u> FLARE	Date Permit Issued 07/25/2005	e actual permi
•	 This may not I Permits issued The images lin Some errors m Permit Number 05-A-645 05-A-645-S1 	Project Number 05-422 10-704 10-704	may not have page are not a introduced in i EP-05 EP-05 EP-001	been imaged yet. ctual permits. They a maging the actual per <u>Equipment</u> <u>Description</u> FLARE FLARE MSW LANDFILL	Date Permit 1ssued 07/25/2005 02/08/2011 02/08/2011	e actual permi
•	 This may not I Permits issued The images lin Some errors m Permit Number 05-A-645 05-A-645-S1 11-A-088 	Project Number 05-422 10-704 Send que	may not have page are not a introduced in i Emission Point EP-05 EP-05 EP-001 stions and comm	been imaged yet. ctual permits. They a maging the actual pe <u>Equipment</u> <u>Description</u> FLARE FLARE	Date Permit Issued 07/25/2005 02/08/2011 02/08/2011 nr.iowa.gov	e actual permit
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DEPARTMENT OF NATURAL RESOURCES CONSTRUCTION PROJECT STATUS REPORT								
State of Iowa Iowa DNR	State of Iowa Iowa DNR							
Construction Project Status Report								
Search by County Search by City Search by Plant Search by Project New Application Home								
County Nam	e: DICKINSON							
City Nam	e: SPIRIT LAKE							
Plant Nam	e: DICKINSON LANDFILL							
Plant Numbe	er: 30-01-017							
Project Numb	er: 05-422							
Source Typ	be: Unknown							
Application Received Da								
Review Engineer Assigr Da	le:							
Additional Informat Da	ion _{None} te:							
Review Engine	er: GOEDKEN, MARK							
Phone Numb	er: 515-725-9533							
Email Addres	ss: MARK.GOEDKEN@DNR.IOWA.GOV							
Current State	JS: FINAL							
Phase State	JS: FINAL							
Final Action Da	te: 2005-07-25							
Final Action State	us: ISSUED							
Project Numb	er: 10-704							
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Application Received Da								
Review Engineer Assign Da	ned 2011-01-31							
Additional Informat Da	ion None te:							

Date.	
Review Engineer:	GOEDKEN, MARK
Phone Number:	515-725-9533
Email Address:	MARK.GOEDKEN@DNR.IOWA.GOV
Current Status:	FINAL
Phase Status:	FINAL
Final Action Date:	2011-02-08
Final Action Status:	ISSUED

Send questions and comments to spars hd@dnr.iowa.gov

State of Iowa | DNR Home | Site Policy Leading Iowans in caring for our natural resources. | V2.1.263

APPENDIX M

List of Questions and Concerns

LIST OF QUESTIONS AND CONCERNS

WASTE CHARACTERIZATION AND WASTE ACCEPTANCE

CONCERN NO. 1: TIMELINE OF WASTE PROFILING AND DISPOSAL

The starting date for disposal of Vegetation Impacted with Crude Oil (102875IA), and for Crude Bottoms (102924IA) are one day before the respective waste profile approval dates. Additional information is needed to clarify the date of delivery for the initial loads of these two waste streams.

Laboratory analytical results for total metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) were added to the Soil Impacted with Crude Oil waste stream profile approximately three weeks after the first loads were delivered to the landfill.

CONCERN NO. 2: NUMBERS OF SAMPLES AND SAMPLING DATES

Few samples were collected and analyzed for the waste stream representing 85.9 percent of the waste delivered for disposal, Soil Impacted with Crude Oil. The ratio of samples to the number of tons of Soil Impacted with Crude Oil is far less than described by BNSF representative at the Joint Informational Meeting.

C&F does not consider it adequate for a single sample of the Soil Impacted with Crude Oil waste stream to be analyzed for total metals.

It is not clear if the document prepared by Arcadis entitled "Standard Operating Procedures for Onsite Waste Management and Sampling, BNSF Doon, Iowa" (SOPs for OWM&S) was reviewed and approved by any regulatory agency or by Waste Management.

It is not known if DNR and Waste Management concur with BNSF and Arcadis strategy to only collect waste stream characterization samples at the beginning of a cleanup that continued on for months.

CONCERN NO. 3: CHEMICAL ANALYTICAL PARAMETERS

Why was it not necessary to analyze these waste streams for polycyclic aromatic hydrocarbons (PAHs) when crude oil is a likely source of those contaminants?

CONCERN NO. 4: SAMPLE COLLECTION PROCEDURES AND DOCUMENTATION

Why was a composite sampling technique used to collect waste stream samples to be analyzed for volatile organic compounds (VOCs) when VOCs are lost during the mixing process?

Pursuant to Iowa solid waste regulations, the Doon derailment waste streams are not allowed to contain free liquids. Review of the laboratory analytical reports indicates no waste

samples were subjected to testing for free liquids. It would be prudent to obtain an explanation for the lack of free liquids testing from BNSF, Dickinson Landfill and/or the DNR. Perhaps it would be beneficial to obtain additional documentation such as copies of waste sample log forms or field notes that might provide descriptions of the waste materials, observations about moisture content of the waste materials, and further details about sampling procedures.

MAJOR RELEVANT ENVIRONMENTAL REGULATORY PROGRAMS

SOLID WASTE REGULATIONS

Issue 1 - High Water Table

A high water table is reportedly present in at least part of the current landfill footprint (Phases B and C) such that the required vertical separation distance of five feet between the water table and the landfill liner is not achieved without an underdrain system. The underdrain system empties into a holding pond where the groundwater is treated for VOCs by a natural wind aerator, periodically tested for VOCs, and when VOCs are less than regulatory limits, the water is discharged from the holding pond to an existing gully near the Spring Run Wetlands Complex.

How likely are future phases of landfill development to need an underdrain system?

It may be appropriate to test the underdrain collection system water for PAHs and other leachate indicator parameters before future discharges.

Is underdrain collection system discharge really consistent with its regulation of as a stormwater discharge covered by the Iowa NPDES General Permit No. 1 for Industrial Users?

Issue 2 - Special Waste

What were the deciding factors in proceeding with the variance granted by DNR to Waste Management on June 27, 2018 allowing direct disposal of petroleum contaminated soil (PCS) without the normal pre-treatment?

Is there a list of current special waste authorizations for disposal of materials like railroad ties, asbestos containing materials (ACM), coal combustion ash, and petroleum contaminated soil, and mixed waste including televisions, monitors computers and other electronic waste with dirt, wood, cardboard, broken CRT glass and other debris at Dickinson Landfill? It is unclear if the hydrologic monitoring performed by the landfill includes analytical parameters capable of evaluating whether hazardous constituents within these special wastes.

Are the dates and quantities of the various types of special waste brought to Dickinson Landfill for disposal reported to DNR on a regular basis?

Why are there no laboratory analytical reports containing paint filter liquids test results when the June 27, 2018 PCS variance specifies that the untreated PCS must not contain free liquids as determined by the paint filter liquids test?

Issue 3 - VOCs in Groundwater

In the mid 1990's VOCs were detected in three monitoring wells (MW-11, MW-12 and MW-23) located in close proximity to each other in the northeastern portion of the Dickinson Landfill. The three monitoring wells with VOC detections in groundwater are located adjacent to the oldest part of the landfill in the eastern 25 to 30 percent of the currently permitted area where there is no landfill liner. An environmental assessment conducted by Sanifill concluded that the source of the VOCs was subsurface migration of landfill gas and not leachate. Dickinson Landfill continues to conduct landfill gas extraction as a groundwater corrective action to mitigate the detection of VOCs within monitoring wells located in the northeastern portion of the Dickinson Landfill. In examining the effectiveness of gas extraction system in reducing VOC concentrations, Dickinson Landfill previously estimated that this corrective action will need to operate at least to 2029.

What is the Dickinson Landfill's current estimate of the remaining duration for operation of the landfill gas extraction system that will be needed to remediate VOC concentrations in groundwater?

AIR QUALITY REGULATIONS

Based on the design capacity for placement of waste, the existing air quality (construction) permits related to landfill gas emissions do not require any compliance demonstrations or performance testing. There is no requirement for continuous emission monitoring associated with these two permits - uncollected emissions from the landfill waste and collected emissions from the landfill waste.

Given the variety and quantity of special waste accepted for disposal, it is unclear if there is adequate air quality monitoring done in the immediate vicinity of the landfill. In the absence of analytical data, DNR cannot offer assurance that the landfill gas emissions are safe for human health and the environment.

SURFACE WATER QUALITY REGULATIONS (NPDES)

The Dickinson Landfill is subject to certain requirements of the National Pollutant Discharge Elimination System (NPDES), a federal permit program that seeks to mitigate against water pollution by regulating point sources that discharge pollutants to waters of the United States. In particular, stormwater runoff that discharges from the Dickinson Landfill is subject to the NPDES regulations. Currently, Dickinson Landfill has NPDES stormwater coverage under Iowa General Permit No. 1 for stormwater associated with industrial activity (DNR Authorization # IA - 19336 - 19107). NPDES Storm Water General Permit No. 1 does not require reporting of sampling results and does not have effluent water quality limits.

Why does storm water monitoring at Dickinson Landfill consist of collecting one sample from one outfall (Outfall 2A) annually when stormwater is known to discharge from the site in three other areas of the property?

How is it that a "qualifying storm event" that requires stormwater sampling did not occur in 2016 or 2017?

C&F believes that the public is better served by giving stormwater permit coverage to Dickinson Landfill via an individual permit that has additional monitoring and reporting requirements rather than General Permit No. 1.

It would be appropriate to include VOCs and PAHs with the required analytical parameters for the annual NPDES sample.

WETLANDS

A few questions worth considering about the current stormwater flow from the landfill into the adjoining wetland areas and about the future expansion of the landfill into the onsite wetlands are as follows:

- Is there sufficient baseline environmental assessment information for the wetlands just downstream of the areas to be filled?
- Periodic monitoring, inspection, assessment of the wetlands immediately downstream of the landfill may be appropriate.
- When does Dickinson Landfill foresee that they will initiate their construction project in the 1.2 acres of wetlands at the site?