



CITY of NOVI CITY COUNCIL

Agenda Item G
April 27, 2009

SUBJECT: Approval of Hold Harmless Agreement for methane gas ventilation system at the Vantage Pointe (f/k/a Terrapin Crossing) development, located on parcel no. 22-23-351-063 & 064 at the northeast corner of Novi Road and Ten Mile Road.

SUBMITTING DEPARTMENT: Department of Public Services, Engineering Division ^{RH} _{BTL}

CITY MANAGER APPROVAL: 

BACKGROUND INFORMATION:

During the underground phase of construction for Vantage Pointe, the developer discovered an organic peat layer of subsurface soils which generated a measureable quantity (as determined by the Michigan Department of Environmental Quality for residential and commercial standards) of methane gas. The developer hired two geotechnical engineers to devise a collection/ventilation/monitoring system capable of capturing the methane gas, venting the gas safely and alerting the proper response agencies in case of a failure.

The developer has provided all the necessary controls for the methane collection/ventilation/monitoring system. In order to further protect the City and tenants on the property now and in the future, the City of Novi Engineering Division and Community Development Department are requiring the developer, J.B. Donaldson Company LLC, to provide a hold harmless agreement. This agreement will include an *Operation, Maintenance and Contingency Plan Manual* for the purpose of disclosing and informing future City of Novi employees, agents, consultants, residents, patrons and tenants to the possibilities for danger with this type of hazard. The agreement will be recorded with Oakland County Records.

The enclosed Hold Harmless Agreement has been favorably reviewed by the City Attorney (Beth Kudla's March 31, 2009 letter, attached) and is recommended for approval.

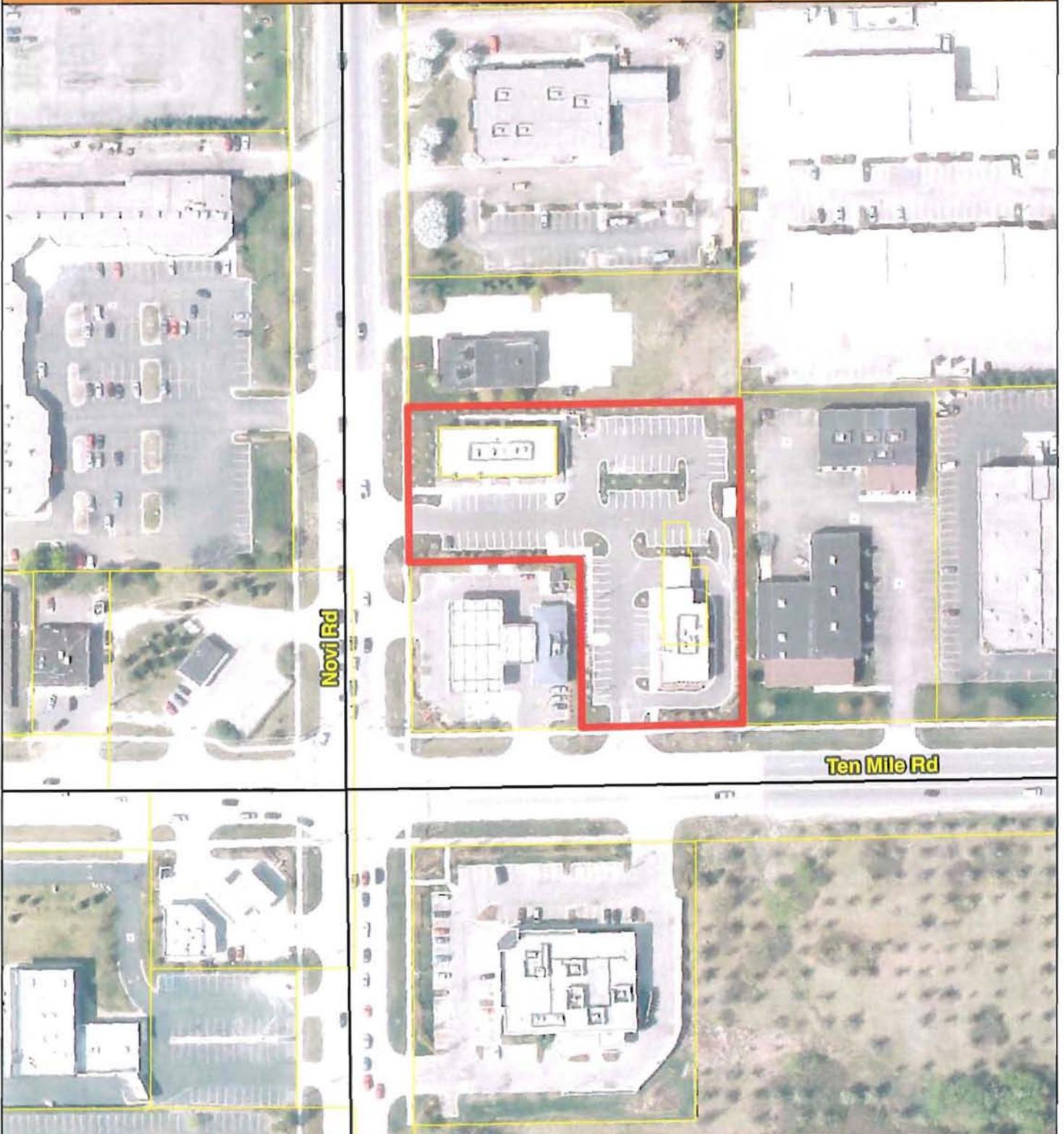
RECOMMENDED ACTION: Approval of Hold Harmless Agreement for methane gas ventilation system at the Vantage Pointe (f/k/a Terrapin Crossing) development, located on parcel no. 22-23-351-063 & 064 at the northeast corner of Novi Road and Ten Mile Road.

	1	2	Y	N
Mayor Landry				
Mayor Pro Tem Gatt				
Council Member Burke				
Council Member Crawford				

	1	2	Y	N
Council Member Margolis				
Council Member Mutch				
Council Member Staudt				

Location Map

Vantage Pointe



CITY OF NOVI

ENGINEERING DIVISION
45175 W TEN MILE RD
NOVI, MI 48375-3054
(248) 347-0454
MAP AUTHOR: Brian Coburn, PE



0 55 110 220 330

FEET

1 INCH = 135 FEET

MAP PRINT DATE: 4/20/09

MAP INTERPRETATION NOTICE

Map information depicted is not intended to replace or substitute for any official or primary source. This map was intended to meet National Map Accuracy Standards and use the most recent accurate sources available to the people of the City of Novi. Boundary measurements and area calculations are approximate and should not be construed as survey measurements performed by a licensed Michigan Surveyor as defined in Michigan Public Act 132 of 1970 as amended. Please contact the City GIS Manager to confirm source and accuracy information related to this map.

March 31, 2009

30903 Northwestern Highway
P.O. Box 3040
Farmington Hills, MI 48333-3040
Tel: 248-851-9500
Fax: 248-851-2158
www.secretwardle.com

Elizabeth M. Kudln
Direct: 248-539-2846
bkudln@secretwardle.com

Rob Hayes, Director of Public Services
CITY OF NOVI
45175 West Ten Mile Road
Novi, Michigan 48375-3024

**Re: Vantage Pointe
Methane Gas Ventilation System Hold Harmless Agreement
Our File No. 660069.NOVI**

Dear Mr. Hayes:

As you know, prior to beginning construction of this commercial, retail and restaurant development near the intersection of Ten Mile and Novi Roads, the developer of the Vantage Pointe shopping center discovered that subsurface organic peat was generating a measurable quantity of methane gas escaping from the property. Based on the discovery, the developer hired SCS Engineers to design a methane gas monitoring and ventilation system for the site. The system was installed concurrently with the construction of the buildings on the site. A third-party engineer, McDowell & Associates, was hired to observe and oversee that the methane gas monitoring and ventilation system was installed in accordance with the plan prepared by SCS Engineers. McDowell & Associates submitted their final report on August 21, 2007 approving the installation in accordance with the plans. A copy of the report is enclosed.

Additionally, the City's Fire Marshal reviewed and approved the plans for the methane gas detection alarm system.

Because this type of methane gas ventilation system is not common within the City, and the City's fire department has been "connected" to the monitoring system to receive an alarm if the methane gas collects above a safe level in the buildings, the City has requested, and the developer has executed, a Hold Harmless Agreement with respect to damages arising from or in any way relating to the methane gas emanating from the site. Our office has prepared the Hold Harmless Agreement for execution by the developer and the City. The purpose of the Hold Harmless Agreement is not only to indemnify and hold harmless the City for any damages arising from the methane gas emanating from the site, but also to give potential purchasers of the site notice of the existence of the methane system, including a copy of the as-built plan and the Operation, Maintenance and

Rob Hayes, Director of Public Services

March 31, 2009

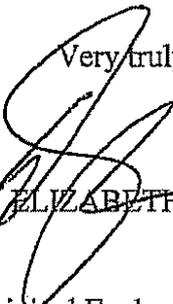
Page 2

Contingency Plan Manual relating to the monitoring and ventilation system. The Agreement will be recorded with Oakland County Records.

We are satisfied that the enclosed Hold Harmless Agreement is satisfactory for these purposes.

Please feel free to contact me with any questions or concerns in regard to this matter.

Very truly yours,



ELIZABETH M. KUDLA

EMK

Enclosures

- C: Maryanne Cornelius, Clerk (w/original Enclosures)
- Steve Rumpel, Director of Community Development (w/Enclosures)
- Charles Boulard, Building Official (w/o Enclosures)
- Aaron Staup, Construction Engineering Coordinator (w/Enclosures)
- Ted Meadows, Spalding DeDecker (w/o Enclosures)
- Tim Wittebort, Esquire (w/Enclosures)
- J. Bennett Donaldson, JBD 5, LLC (w/Enclosure)
- Lee Liscio, (w/o Enclosure)
- Thomas R. Schultz, Esquire (w/Enclosures)

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HOLD HARMLESS AGREEMENT

THIS AGREEMENT ("Agreement") is made this ____ day of _____, 2008, between the CITY OF NOVI, a Michigan municipal corporation, whose address is 45175 West Ten Mile, Road, Novi, Michigan 48375 (the "City"), and JBD 5, LLC, a Michigan limited liability company, whose address is 41850 West Eleven Mile Road, Suite 100, Novi, Michigan 48375 (the "Owner").

RECITATIONS:

A. Owner owns fee title in and to the property (the "Property") legally described as follows:

Land situated in the State of Michigan, County of Oakland, City of Novi:

Units 1 and 2, and General Common Elements of the Vantage Pointe Commercial Condominium, Oakland County Condominium Subdivision Plan No. 1952, as established by the Master Deed therefore recorded in Liber 39556, page 169 of Oakland County Records on September 11, 2007, as amended by the Amended and Restated Master Deed for Vantage Pointe Commercial Condominium, recorded in Liber 39847, Pages 322 through 374, Oakland County Records on December 18, 2007.

B. Owner received final site plan approval to develop the Property as a commercial condominium for commercial, retail and restaurant uses pursuant the City of Novi Zoning Ordinance.

C. A Soils Investigation Report ("Soils Report") was undertaken by Owner in preparation to design and construct the commercial, retail and restaurant buildings. The Soils Report, completed by McDowell & Associates, Inc. and dated December 8, 2004, identifies the existence of subsurface organic peat generating measurable quantities of methane gas on the Property. The Soils Report indicates that a methane gas ventilation system is necessary to properly vent gases from under the buildings.

D. Owner retained a methane gas consultant, SCS Engineers (the "Designer"), to design a Methane Mitigation Plan, ("Plan"), including (1) a building methane gas venting system, (2) protection of the occupied spaces, (3) utility trench plugs, (4) roadway and parking lot venting system, (5) methane

gas migration controls, and (6) methane gas detection and alarm system for the Property. The Plan is attached as Exhibit A.

E. The Methane Gas System ("System") based on the Plan was constructed by the Property Owner's contractors, and was overseen and inspected by a third party inspection agency, McDowell & Associates, Inc., in accordance with Section 106.3.4 of the 2003 Michigan Building Code. The inspection report was certified by the third-party inspector and provided to the City. The Inspection Report issued by McDowell & Associates, Inc. is attached as Exhibit B.

F. The interior spaces of the buildings on the Property are intended to be protected by gas sensors and alarms that are designed to trigger in the event of methane gas concentration above safe levels as designated by the Designer.

G. The gas alarms have been designed by the Owner's agents and/or contractors to notify the building occupants and the Novi Fire Department in the event the methane gas concentration rises above the level programmed into the alarm system by the Designer.

H. The City's Fire Marshal has reviewed and approved the gas alarm system plan. The Fire Marshal's review approval report is attached as Exhibit C.

I. The Designer has prepared a manual including instructions regarding the operation and repair and replacement of the gas alarm system. The manual is attached as Exhibit D.

J. Because the City's Fire Department is incorporated into the procedures set forth in the gas alarm system manual, and the alarm is designed to notify the Novi Fire Department in the event of a concentration of methane gas exceeding safe levels; and, further because the System is unusual within the City, the Owner desires to indemnify and hold harmless the City, its agents, employees, boards, councils and officials for claims and damages arising out of or related to methane gas emanating from the Property and enters into this Agreement for such purpose.

NOW, THEREFORE, IT IS AGREED AS FOLLOWS:

1. Owners and its successors, assigns and transferees, agree to, and hereby release, indemnify, defend and hold harmless the City of Novi, and its Council, commissions, consultants, employees, agents, representatives, or designees (hereinafter collectively "the City") from any and all claims, demands, causes of action, or damages of any kind or nature against the City, brought by the Owners or others, arising by reason of, or in any way associated with, methane gas emanating from the Property. This includes, without limitation, claims, demands, costs, or judgments against the City whether such liability, loss, or damage is due or claimed to be due to the action or inaction of the Owner, its subcontractors, the City, its consultants, officers, agents, and employees.

2. Owner acknowledges that Owner shall inform its successors and assigns, and any tenants on the Property regarding the System, and its operation and maintenance. Further, the Designer, indicates in its Supplement to Section 7a Compliance Analysis, attached as Exhibit F, that changes in the building foundations, utility lines to the buildings, or other subslab building components may result in conflicts with the System as constructed. Therefore, Owner acknowledges and agrees that in the event

of any such changes, the necessary adjustments shall be made to the System, and proof of such changes, including third-party inspection reports, shall be provided to the City for its records.

3. Owner agrees, as owner of the above-described Property, that this Agreement shall be recorded, and that the representations and obligations herein are binding upon its successors and assigns.

4. No amendment to this Agreement shall be effective and binding upon the City unless it expressly makes reference to this Agreement, is in writing, is signed and acknowledged by duly authorized representatives of Owner and the City and is approved by City Council.

5. If any provision of this Agreement or its application to any person or circumstance shall to any extent be invalid or unenforceable, the remainder of this Agreement shall not be affected and shall remain valid and enforceable to the fullest extent permitted by law.

6. The rights and remedies set forth in this Agreement are not exclusive and are in addition to any of the rights or remedies provided by law or equity. This Agreement and all actions arising under it shall be governed by, subject to, and construed according to the law of the State of Michigan. Each party agrees, consents and submits to the exclusive personal jurisdiction of any state or federal court of competent jurisdiction in Oakland County, Michigan, for any action arising out of this Agreement. Each party also agrees that it shall not commence any action against the other party because of any matter whatsoever arising out of or relating to the validity, construction, interpretation and enforcement of this Agreement in any state or federal court of competent jurisdiction other than one in Oakland County, Michigan.

7. This Agreement may be executed in any number of originals, any one of which shall be deemed an accurate representation of this Agreement.

8. The rights and benefits under this Agreement shall inure to the benefit of and be binding upon the respective parties hereto, their agents, successors, and assigns.

9. Any and all documents, memoranda, reports, exhibits or other written material referred to in this Agreement are and shall be incorporated by reference herein.

10. The Owner and the City, do further warrant and represent that they have fully read this Agreement and understand its contents and meaning, have had the opportunity to consult with advisors or counselors of each one's own selection regarding the advisability of entering into such a release, and that they are otherwise fully satisfied with the terms and conditions as well as the limitations and waivers of rights that they are entering into through the execution of this Agreement.

OWNER:

JBD 5, LLC, a Michigan limited liability company

By: 
Its: Brad Klintworth
Manager

STATE OF MICHIGAN)
) ss.
COUNTY OF OAKLAND)

Subscribed and sworn to before me this 29th day of December, 2008 by Brad Klintworth the Manager of JBD 5, LLC, a Michigan limited liability company, on behalf of the company.


Notary Public, N. Thomas County, MI
My Commission Expires: 7/20/2011

N. THOMAS
Notary Public, Oakland County, MI
My Commission Expires July 20, 2011
Acting in Oakland County, Michigan

N. THOMAS
Notary Public, Oakland County, MI
My Commission Expires July 20, 2011
Acting in Oakland County, Michigan

CITY:

CITY OF NOVI, a Michigan municipal corporation

By: _____
David Landry
Its: Mayor

By: _____
Maryanne Cornelius
Its: Clerk

STATE OF MICHIGAN)
) ss.
COUNTY OF OAKLAND)

The foregoing Agreement was acknowledged, signed and sworn to before me on this _____ day of _____, 2008 by David Landry, Mayor of the City of Novi, and Maryanne Cornelius, Clerk of the City of Novi, on behalf of the City.

Notary Public, _____ County, MI
My Commission Expires: _____

Drafted by:

Elizabeth M. Kudla
Secretst Wardle
30903 Northwestern Highway
PO Box 3040
Farmington Hills, Michigan 48333-3040

When recorded return to:

Maryanne Cornelius, Clerk City of Novi
45175 W. Ten Mile Road
Novi, Michigan 48375
C:\NrPortbl\lmanage\BKUDLA\1164652_1.DOC

Exhibit A

Exhibit B



McDowell & Associates

Geotechnical, Environmental & Hydrogeological Services - Materials Testing & Inspection
21355 Hatcher Avenue • Ferndale, MI 48220
Phone: (248) 399-2066 • Fax: (248) 399-2157

August 21, 2007

J.B. Donaldson Company
41850 West Eleven Mile Road
Suite 100
Novi, Michigan 48375

Attention: Mr. Bennett Donaldson

Subject: Gas Control System Installation
Vantage Point
Northeast of Novi and Ten Mile Roads
Novi, Michigan

Dear Mr. Donaldson:

As you have reported, we have completed this letter to document our observation of construction of the gas control system on the property.

McDowell & Associates was present on site and witnessed construction of boundary vents, building vents, and parking lot collection piping described in SES Engineers' Vantage Point Gas Control System As Built Drawing, dated August 17, 2007.

If you have questions regarding the information contained in this letter, please do not hesitate to call.

Very truly yours,

McDOWELL & ASSOCIATES


Douglas M. McDowell, M.S., P.E.
Environmental Manager

DMM/dfc



Mid-Michigan Office

3730 James Savage Road • Midland, MI 48642
Phone: (989) 496-3610 • Fax: (989) 496-3190

Exhibit C



city of novi

FIRE DEPARTMENT

July 6, 2007

J. Bennett Donaldson
J.B. Donaldson Co.
41850 Eleven Mile Rd., Suite 100
Novi, MI 48375

RE: Vantage Pointe Plaza Methane Gas Monitoring Requirements

Dear Mr. Donaldson,

I have reviewed the methane gas control plan and the reply from C.E. Satchwell of SCS Engineers regarding my concerns with the plan for the Vantage Pointe Plaza at Ten Mile and Novi Rd. I find that Mr. Satchwell's letter addresses my concerns for the installation of the control system.

The purpose of this letter is to clarify what the requirements will be for the monitoring system in these buildings. Utilizing the proposed State of Michigan rules for Methane Gas Control Methods and Chapter 1 of the International Fire Code that grants Fire Code Official the authority to determine requirements that are essential for the public safety; the following will be required:

1. Each occupied space shall be equipped with a listed methane gas detector.
2. The detectors shall be monitored by a listed fire alarm control panel that reports a trouble and alarm condition to a central or remote monitoring service. The FACP shall be located where approved by this office.
3. Each occupied space shall be equipped with at least one audible and visible signal that is located in a public area and labeled as a Methane Gas Alarm.
4. The gas detectors shall alarm at 20% of the Lower Explosive Limit.

Plans for the above system shall be submitted for review and permitting through the Novi Building Department and the system shall be subject to full acceptance testing by the Fire Department prior to occupancy of any tenant space.

Please contact my office if you have any questions regarding this matter.

Sincerely,

Michael W. Evans
Fire Marshal

cc: Novi Building Department
file

42975 GRAND RIVER AVE. NOVI, MICHIGAN 48375-1731 (248) 349-2162

Exhibit D

DRAFT

OPERATIONS, MAINTENANCE AND CONTINGENCY PLAN

**HUNTINGTON BANK
BUILDING B
VANTAGE POINTE**

NOVI, OAKLAND COUNTY, MICHIGAN

Prepared for:

J. B. Donaldson Company, Inc.
41850 W. Eleven Mile Road
Suite 100
Novi, Michigan 48375
(248) 344-9045

Prepared by:

SCS Engineers
2060 Reading Road
Cincinnati, Ohio 45202
(513) 421-5353

File No. 05205025
July 2007

IMPORTANT NOTICE

A COPY OF THIS PLAN SHOULD BE KEPT READILY AVAILABLE, AS A REFERENCE, IN THE OCCUPIED SPACES WHERE ALARMS HAVE BEEN INSTALLED.

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	Sierra Model 2102- 2 Channel Gas Alarm Panel	
	Calibration Gas Delivery System	

METHANE CONTINGENCY PLAN

1.0 INTRODUCTION

This Methane Contingency Plan (Plan) has been developed as a guide to assist in the response to an alarm activation of a methane monitor. It is intended to cover potential issues that could arise associated with methane monitors installed in the Huntington Bank, Building B at the Vantage Pointe development in Novi, Michigan.

This Plan is intended to provide information regarding actions necessary by on-site personnel and first responders in the event of an activation of a methane monitor in the building.

Contact names and telephone numbers of manufacturers, installers, monitoring personnel, and combustible gas consultants have been included for technical questions not covered in this Plan.

2.0 DESCRIPTION OF MONITORS

The monitors at these facilities are semiconductor-type Model 2001 Combustible Gas Sensor Monitors and Model 2102 – 2 Channel Gas Alarm Panels manufactured by Sierra Monitor Corporation of Milpitas, California.

The system will sound a local alarm if combustible gas is present above pre-set concentrations. The threshold set points on the monitors are adjustable. With the suitable calibration gas the threshold limit can be set wherever the monitoring personnel choose, within the range capability of the monitor. SCS recommends threshold limits set at 20% of the LEL. This threshold provides ample warning of combustible gas concentrations at unacceptable levels without the problems associated with false alarms.

If the on-site personnel choose to investigate the cause of the alarm activation, doors should be opened to air out the space where the monitor was activated while the investigation is being performed. Care should be taken not to activate any electrical devices during the investigation that could cause a spark. If on-site personnel cannot determine the cause of the activation and correct the situation within several minutes, the building should be evacuated and await the arrival of the Novi Fire Department. The monitors will be connected to the building security system through the alarm panels which will result in automatic notification of the monitoring service. The monitoring service will immediately notify the Novi Fire Department when the threshold limit is exceeded at any of the monitors.

3.0 TRAINING

If so desired, designated on-site personnel should be instructed in the operation and maintenance requirements of the monitors. All employees should be made aware of the monitors and alarm panels and what to do if an alarm sounds. Only designated personnel should be permitted to operate, maintain, and respond to alarms.

4.0 TESTING AND CALIBRATION

The monitors are normally factory set at 1000 parts per million (2% LEL). The units should be field-adjusted to 20 % LEL as they are installed or by designated personnel after installation. Calibration should be performed on a regular schedule (generally monthly for the first three months and then at 3-month intervals) to ensure the proper operation of the units. Calibration should be performed by an authorized representative of the manufacturer or other qualified personnel.

5.0 OPERATIONS

The monitoring system has been installed and calibrated at the time of installation. No routine maintenance is required to keep the monitors and alarm panels in working order. However, the units should be inspected quarterly for worn parts, such as frayed cords, damaged plugs, damaged housings, damaged sensors, etc. to ensure they are kept in good condition. These maintenance activities should be combined with the re-calibration and/or testing of the monitors.

The trained personnel should follow the procedures outlined in this Plan. The procedures include testing the system to identify a possible malfunction (false positive activation, sensor failure, etc.) in the monitoring system, re-calibration of the monitor that malfunctioned, replacement of a failed sensor, physically monitoring the area for methane, and opening doors/windows and setting up fans to provide ventilation of the area.

6.0 REPAIR AND REPLACEMENT

Since there are no moving parts in this monitoring system, it is unlikely that any of the components will need repair unless damaged due to tampering, accident, or outside influence (exposure to toxic gas, water, electrical surge, etc.). Because these units are inexpensive, the malfunctioned unit will most likely be replaced, rather than repaired. The sensor modules are designed to last a minimum of two (2) years under normal circumstances without exposure to toxic gases. Unusual conditions could shorten the life of the sensor modules. Routine observations and monitoring activities should include checking the sensors for need of replacement.

7.0 POTENTIAL ISSUES

The monitors should provide years of trouble-free operation. However, there is a potential for a problem that could arise causing the alarm to sound. Alarms may sound if:

1. Combustible gas has been detected that is at or above the preset detection limit.
2. A failure of the monitor has occurred.
3. The monitor has malfunctioned.
4. The monitor needs to be reset.
5. Someone has tampered with the monitor.

8.0 RESPONSE TO ISSUES

When an alarm light and/or audible signal is activated, the following protocol should be followed:

1. Check the monitor for a malfunction. If the alarm is flashing an alternating red/green visual signal and sounds an intermittent audible signal, a malfunction has occurred.
2. Follow the procedure outlined in the manufacturer's literature to determine if the activation is a malfunction or gas detection.
3. Check the electrical power supply to the monitor (it may have been unplugged).
4. Attempt to reset the monitor by pressing the "reset" button. If a malfunction has occurred, contact the manufacturer for repair.
5. If the problem cannot be identified and corrected within a few minutes after arriving at the monitor or if there is a verified alarm, take this Plan with you and follow the EVACUATION PLAN.

9.0 EVACUATION PLAN

IF IT BECOMES NECESSARY TO EVACUATE THE BUILDING, AS A RESULT OF A VERIFIED ALARM INCIDENT, THE FOLLOWING STEPS ARE NECESSARY TO ENSURE THE SAFETY OF THE BUILDING OCCUPANTS:

1. Turn off all machinery, extinguish all flames and smoking materials, and evacuate the building immediately.
2. **Do not turn off lights.**

3. **Do not activate electric overhead door openers.**
4. Leave interior and exterior doors and windows open as the building is evacuated. **Do not open windows that are not already open.**
5. Evacuate the building to a predetermined location and confirm that all personnel have left the building.
6. Await the arrival of the Novi Fire Department. The Fire Department was notified automatically when the monitor sensed combustible gas above the threshold set limit.
7. Remain outside the building. **Do not re-enter the building until specifically authorized to do so by the fire department.**
8. The fire department should physically monitor the area for combustible gases to determine if gas concentrations are at or above the alarm level in an attempt to confirm the alarm's detection, and to determine the nature and source of the positive reading.
9. Only fire department personnel should reenter the building until such time as the cause for the alarm has been determined and corrective measures have been taken to make the building safe for occupancy.
10. For additional assistance with the operation of the monitoring equipment, contact the manufacturer to determine what may be causing the problem if it does not appear to be related to excessive combustible gas concentrations in the building.

10.0 EQUIPMENT CUT SHEETS

Cut sheets in Appendix A are copies of the documents prepared by the manufacturer of the methane monitoring system equipment. Included herein are cut sheets for the Sierra Monitor Corporation Model 2001 Gas Sensor Monitor, the Model 2102 – 2 Channel Gas Alarm Panel, and the Calibration Equipment.

11.0 CONTACTS

The following is a list of the combustible gas system component manufacturer, the installer of the equipment, and the designers of the system. Problems with any of the components that can not be resolved by on-site personnel should be referred to the fire department.

Manufacturer -

Sierra Monitor Corporation
1991 Tarob Court, Milpitas, California 95035
E-mail: sierra@sierramonitor.com
800-727-4377

(408) 262-6611
FAX (408) 262-9042

Installer -

(To be completed after installation of equipment)

Landfill Gas Consultant -

SCS Engineers
2060 Reading Road, Suite 200
Cincinnati, Ohio 45202
(513) 421-5353
FAX (513) 421-2847
Contacts: Charles Satchwill,
csatchwill@scsengineers.com
James J. Walsh, jwalsh@scsengineers.com

APPENDIX A
EQUIPMENT CUT SHEETS

Exhibit F

ATTACHMENT _____

SUPPLEMENT TO SECTION 7a COMPLIANCE ANALYSIS

METHANE MITIGATION PLAN

**TERRAPIN CROSSING
NOVI, MICHIGAN**

RECEIVED BY
BUILDING DEPT
DEC 20 2006
CITY OF NOVI

Prepared for:

McDowell & Associates, Inc.
21355 Hatcher Ave.
Ferndale, MI 48220
(248) 399-2066

Prepared by:

SCS Engineers
2060 Reading Road
Cincinnati, Ohio 45202
(513) 421-5353

File No. 05205025
March 2006
Revised December 2006

B06-0234
B06-0235

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- 3 Building B Gas Control System Layout
- 4 Gas Control Details
- 5 Gas Control Details

SUPPLEMENT TO SECTION 7a COMPLIANCE ANALYSIS

METHANE MITIGATION PLAN

TERRAPIN CROSSING NOVI, MICHIGAN

INTRODUCTION

Terrapin Crossing is a proposed retail development to be constructed at the intersection of Ten Mile Road and Novi Road in Novi, Michigan. Soil borings on the site revealed the presence of subsurface organic peat that is generating measurable quantities of methane gas. The developer is responsible to provide due care measures to ensure that existing conditions on the property do not cause unacceptable risks and is not exacerbated.

This supplement details the proposed control measures to be implemented to ensure that the methane gas found in the soil will be managed to prevent unacceptable human exposure and mitigate fire and explosion hazards to allow for the intended use of the facility in a manner that protects the public health and safety. Included in this supplement are details for the following methane gas control components:

- Building methane gas venting systems
- Protection of the occupied spaces
- Utility line trench plugs
- Roadway and parking lot venting system
- Methane gas migration controls

BUILDING METHANE GAS VENTING SYSTEMS

The methane gas venting system proposed for the buildings consists of a passive gas venting system that will be incorporated into the building design and become an integral part of the building components. Preliminary studies have shown the need for a passive venting system beneath the buildings to provide airflow from the collection zone beneath the entire footprint of each of the buildings. The passive venting system consists of horizontal perforated pipes or geosynthetic venting media embedded in a granular layer beneath the building footprint.

The gases (mostly air) from the venting zone would be free-vented to the atmosphere above the roofline of the buildings. The perforated pipes or venting media will be attached to a solid header pipe outside the building footprint to tie the under-slab collection network to a vent stack that allows disposal of the collected gas above the building roofline at a single location on each of the buildings. This configuration will allow retrofitting of the passive system to an active system in the future, should it ever be necessary to provide positive gas extraction from beneath the building.

The building venting systems will include a network of perforated pipes or venting media spaced approximately 20 feet on center under the entire building footprint (see Drawings 1, 2, and 3). The venting system will be embedded in the granular base material being provided for construction of the building floor slab. The thickness of the granular layer will be a minimum thickness of 12 inches. The venting system effectiveness will be increased by the use of a combination vapor/gas barrier layer beneath the floor slab that will consist of a spray-applied or tightly sealed sheet product that provides good resistance to gas permeability.

The piping/venting media system layout is based on the information available at the time this supplement was prepared. Changes in the foundations of the buildings, utility lines to the buildings, or other subslab building components may result in conflict (s) with the gas venting systems. Minor adjustments to the layout of the venting system may be necessary if changes to the building design occur as the design and construction process moves forward. The venting system can be adjusted for minor conflicts and still provide the level of protection necessary for the building and occupants. Any changes to the venting system layout should be cleared by the designer prior to implementation.

PROTECTION OF OCCUPIED SPACES

The interior spaces of the buildings will be protected by installing gas alarms that will trigger in the event of methane concentration above safe levels. The gas alarms will be stand-alone units that plug into a standard wall outlet and sound an audible and visual signal if the threshold set limit for methane concentration is exceeded. The threshold limit of the gas alarms will be set at approximately 20% of the lower explosive limit (LEL) for methane gas. This threshold limit will allow ample time to identify the reason for the activation of the alarm and take steps to remedy the situation before a real danger to the building or occupants is reached. Several gas alarms will be installed in each of the buildings being proposed for this site.

The gas alarm placement is critical to the proper operation of the units. The units will be installed in small, confined spaces with poor air circulation wherever possible. Areas such as janitorial spaces that contain drains, storage closets, computer equipment rooms, and utility closets generally make the ideal location for the alarms. The alarms will be installed between 6 and 7 feet above the floor level for early detection of gas concentrations within the breathing zone.

UTILITY-LINE TRENCH PLUGS

Utility lines will likely be installed in granular bedding and initial backfill, as would be the case with standard construction practices. The granular backfill material will be utilized as a component of the venting system within the paved parking areas of the development. The utility trenches that connect to the light standards will allow the preferential movement of methane gas to the light standards where it will be vented to the atmosphere. Additional pipe runs in the parking lot as shown on Drawing 1 will supplement the collection and disposal of methane gas from beneath the parking areas.

Special consideration will be given to the termination point of utility trenches where they exit the site at the property boundary or enter the proposed buildings. Bentonite trench plugs will be utilized where the utility lines enter and leave the site to prevent the offsite migration of methane gas through the granular backfill around the pipe. Trench plugs will also be utilized where utility lines enter the buildings to prevent migration of methane gas from the site into or under the building (see Drawing 4).

~~Electrical conduit will be fitted with explosion-proof plugs where it enters fixtures to protect against the migration of methane gas into the fixture via the conduit.~~

ROADWAY AND PARKING LOT VENTING SYSTEM

Provisions for venting the methane gas that could be trapped by the paved areas are necessary. The utility trenches form a convenient gas pathway that can be used to the developer's advantage. Granular backfill around the utility lines can be extended in trenches that lead to landscaped areas or areas where parking lot lighting is being installed. Runs of perforated pipes reaching into the parking areas from the light poles will further assist with providing a pathway for the methane under the roadway and parking paving to be vented to the atmosphere (see Drawing 1).

Vent pipes attached to light standards, or camouflaged vent stacks incorporated within the landscaping will provide positive venting of the gases without negatively impacting aesthetics. The vents will be terminated at an elevation well above the ground surface to prevent the concentration of methane gas and the resultant odors that could come from heavy gas concentrations near the surface. Venting a minimum of ten feet above ground surface will also prevent the accidental ignition of the gas being vented (see Drawing 3).

METHANE GAS MIGRATION CONTROLS

Due care requirements include the prevention of exacerbation of the contamination through migration beyond the property boundary. While the likelihood of off-site migration is minimal, a cut-off trench will be installed along the property boundary that will intercept methane gas that could migrate off site and vent it to the atmosphere within the confines of the property.

Based on the boring logs from the November 2004 subsurface investigations, the methane gas-generating peat appears to be concentrated in the low area in the northeastern portion of the site. The borings installed show shallow layers of peat along the property line that abuts the Speedway station, no peat along the northern, eastern and southern and western boundaries of the site near the property lines. Overburden material above the layers of peat is generally granular consisting of some silty sandy clay, sand lenses, pebbles, and stones. The cut-off trench will consist of a narrow trench filled with granular material to provide the path of least resistance for gas migrating toward the property lines. Five foot deep cut-off trenches around the entire property line will provide the desired pathway to vent the gas to the atmosphere within the confines of the subject property.

The cut-off trench will consist of a buried 6-inch perforated pipe encapsulated in a gravel pack and vent stacks at regular intervals along the property line. The depth of the perforated pipe will be established to intercept laterally migrating methane from the layer of organic peat that is suspected of generating the gas on the site. Vents stacks will be connected to the perforated pipe at maximum intervals of 100 feet along the trench as shown on Drawing 1. The 4-inch vent stacks will terminate approximately four feet above the ground surface with two 90° elbows. The outlet will be covered with a screen to prevent birds and vermin from nesting in the vent stacks.