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DATE October 12, 2017
PROPOSAL P17147R3

ATTN **Kenneth Banks, PhD**
Director
City of Denton – Utilities
215 East McKinney Street
Denton, Texas 76201

SUBJECT Proposal to assist with Oil and Gas Inspection Activities
City of Denton

Dear Dr. Banks:

Modern Geosciences, LLC (Modern) is pleased to provide this proposal to assist the City of Denton (City) with Oil and Gas Inspection Activities. Modern has worked with over 20 municipalities on a variety of oil and gas related needs such as ordinance language, technical support, field inspections, air monitoring, data evaluation, public presentation, and programmatic support. Additionally, Dr. Tramm from Modern Geosciences has previously served on the City of Denton's Gas Drilling Task Force.

This proposal is based on discussions with the City and our understanding of the support being requested. If any additional information is needed or the scope requires further refinement, please let us know. Our intent is to design a cost-effective program reflective of your priorities and information needs.

Modern has included a few project examples demonstrating experience with programmatic oil and gas/air quality monitoring below.

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EXPERIENCE AND PROJECT EXAMPLES

Photo above depicts an Optical Gas Imaging (OGI) leak survey in Flower Mound. OGI allows for faster leak inspections as methane and VOC leaks are visually identifiable.

Project Name: Air Quality/Padsite Inspection Services
Location: Flower Mound, Texas
Dates: January 2012 to Present
Client: Town of Flower Mound
Modern PM: Kenneth S. Tramm, PhD, PG, CHMM

Description: *Modern has performed padsite inspection, sampling and air monitoring services for the Town of Flower Mound since 2012. Dr. Tramm has worked with the town since 2009. Efforts include ambient air sampling, fenceline sampling, near-equipment inspection under strict health and safety procedures, statistical data evaluation, general technical support of soil, groundwater, and air data, and monthly reporting. To date, hundreds of leaks have been identified and addressed by operators. This includes occasional subgrade leaks that would have not been identified using traditional methods and possibly presented explosion hazards to future operations at the site. Additional services have included technical support on city ordinances, staff training, and public presentations. All efforts have been performed on time and on budget.*

Photo above depicts a hydraulic fracturing event in Colleyville. Modern deployed several up and downwind monitors as well as conducted on and off-site air quality surveys. By giving immediate feedback, several emissions were curtailed and impact to neighboring properties was minimized.

Project Name: Air Quality/Padsite Inspection Services
Location: Colleyville, Texas
Dates: 2012 to Present
Client: City of Colleyville
Modern PM: Kenneth S. Tramm, PhD, PG, CHMM

Description: *Modern has supported the City of Colleyville in the performance of oil and gas related monitoring, including continuous air monitoring during several stages of operation (drilling, hydraulic fracturing, flowback) as well as ambient air sampling/monitoring on and off-site. Technical support has included news media interviews, daily reports for city council, staff training, ordinance development support and summary reporting after each event. Efforts have also included soil sampling following a petroleum release during hydraulic fracturing and water well monitoring. All efforts have been performed on time and on budget.*

Exhibit 19 Well I - Leak noted near bleed-off valve (red arrow).

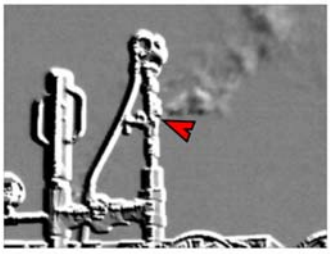

Exhibit 20 Leak shown in high sensitivity mode (red arrow). Methane concentration was noted to be 100% by volume at leak. The operator was notified of the leak.

Photo above depicts an OGI still from Modern's 2015 Audit where a methane leak was identified. Modern's reports are designed to give an operator sufficient information to allow correction of any leaks noted.

Project Name: Leak Detection Program Support and Program Audit
Location: Grand Prairie, Texas
Dates: 2011 to Present
Client: City of Grand Prairie
Modern PM: Kenneth S. Tramm, PhD, PG, CHMM

Description: *Modern worked with the City of Grand Prairie concerning the requirements of a Leak Detection Compliance Program (LDCP). This guidance was used to set minimum requirements from each padsite operator concerning quarterly inspections and reporting. Modern also provided ordinance development support, staff training, air sampling, technical support and an operator training event to provide direction to all operators in the City. In 2015, Modern was asked to perform an audit of the self-reporting program and complete a padsite inspection where over a dozen leaks were identified and reported to the operator for repair. Following this, Modern helped the City update their LDCP guidance in 2017 to include elements of new EPA inspection guidance (Quad Oa). Additionally, Modern performed target padsite inspections for the City in 2017. All efforts were performed on time and under budget.*

Project Name: Air Quality/Padsite Inspection Services
Location: Kennedale, Texas
Dates: 2011 to Present
Client: City of Kennedale
Modern PM: Kenneth S. Tramm, PhD, PG, CHMM

Description: *Modern performed inspection, sampling and air monitoring services for the City of Kennedale. Additional services have included technical support on city ordinances and staff training. The city went to operator self-reporting in 2012 and Modern is consulted on an as-needed basis. All efforts were performed on time and under budget.*

Photo above depicts an Open Path Monitor (OPM) collecting real-time VOC concentration data across separators in Kennedale.

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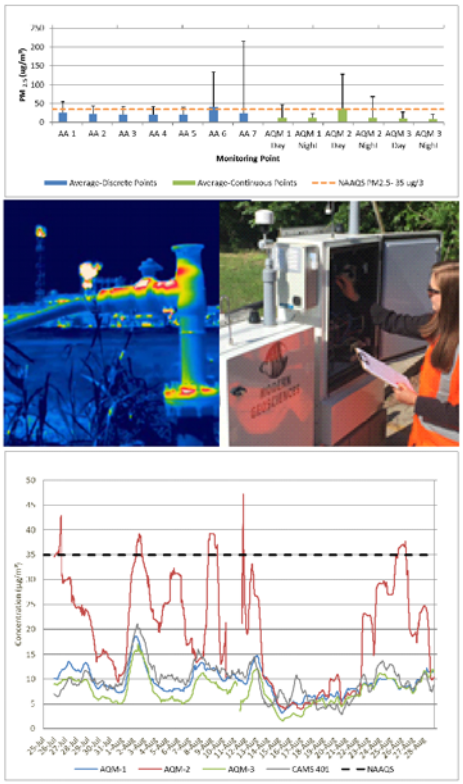
Project Name: Air Quality Evaluation
Location: Dallas, Texas
Dates: 2016
Client: City of Dallas
Modern PM: Kenneth S. Tramm, PhD, PG, CHMM

Description: *Modern assisted the City of Dallas in the performance of an Air Quality Evaluation. In response to public concern that an area landfill and/or nearby industrial operations were impacting an established residential area, the City asked Modern to design and perform a comprehensive air monitoring event. This included review of existing emission source data, deploying three continuous air quality monitors recording ozone, methane, HS, total VOCs, particulate matter ($PM_{2.5}$), wind speed, wind direction, and related meteorological data, and supplementation with seven discrete monitor points with individual VOCs (40+ compounds) through the sensitive receptor area and suspected source areas. The project window was five (5) weeks with confirmation of point source concerns for repair and demonstration that air quality in the sensitive receptor area was below EPA and TCEQ air quality criteria.*

Future improvements are proposed to further reduce emission contribution and continuing monitoring and inspection is proposed. All efforts were performed on time and under budget.



Photos and figures above depict particulate monitoring at both discrete and continuous points as well as an extraction well during infrared leak survey and air quality monitors being calibrated.

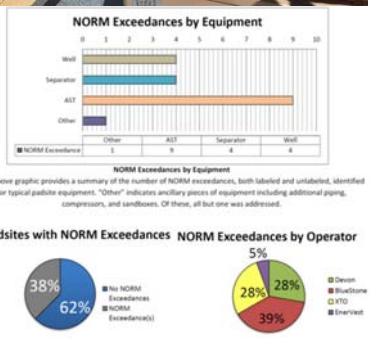
Photo above depicts operator making repairs during Modern's field inspection efforts in Haslet, Texas.

Project Name: Air Quality/Padsite Inspection Services
Location: Haslet, Texas
Dates: 2017 to Current
Client: City of Haslet
Modern PM: Zachary R. Tondre, MS, GIT

Description: *Modern serves as the City's Oil and Gas Inspector and performs annual inspection events on all ~127 wells in the City and ETJ. Efforts not only include near-equipment inspection with OGI and NORM equipment but fenceline monitoring for VOCs, H2S, methane, and noise.*

Modern also designed field checklists to incorporate into the inspection program to assist the City in confirming code compliance during our field inspections.

A total of 23 leaks and 18 NORM exceedances were confirmed in 2017 with all addressed by the operators following notification. As part of Modern's programmatic support, a GIS geodatabase was developed to allow all annual inspection results per padsite to be tracked in perpetuity within the City. An example of NORM inspection in the field and the resulting statistics is included to the right. All efforts were performed on time and under budget.



BACKGROUND AND PROJECT UNDERSTANDING

Modern understands the City is requesting support in the performance and documentation of inspection activities at oil and gas facilities in production within the City limits. Wells within the extraterritorial jurisdiction (ETJ) are not included in this proposal. This is anticipated to include performance of the current City inspection items (e.g., signage, equipment maintenance, fire department access, landscaping, safety requirements) with additional leak detection efforts to better identify and communicate potential leaks and fugitive emission impacts to the City, operator, and community members.

Based on provided information, it is understood there are approximately 294 active wells within the City's corporate city limits. As part of the inspection effort, it is also understood the City wishes to prioritize inspections by proximity to sensitive receptors (e.g., schools, residential areas). An estimate to assist the City in completing the receptor screening is included as Task 1 with some assumptions presented to allow unit pricing included in the following tasks.

SCOPE OF SERVICES

TASK 1: RECEPTOR SCREENING, INSPECTION PRIORITIZATION, AND PROGRAM TECHNICAL SUPPORT

Modern will coordinate with City staff on the final definitions for low, moderate, and high priority inspection sites as well as the frequency of inspection and inspection program corresponding to the different priority sites.

Additionally, Modern will develop GIS-based layers to document padsite infrastructure noted during our field inspections, record inspection results, action items requiring attention, and generate padsite-specific figures that allow clear communication of our findings to all parties. The goal with this platform is to not

only allow this data to further inform multiple city departments within a common platform, but also allow data tracking over time so trends and performance measures are better understood.

A limited budget has been proposed to develop the above materials and provide technical support to the City. A line item for the cost to generate each padsite figure has been included. This is anticipated to be a one time cost with future inspection being able to utilize base figures going forward.

TASK 2: PADSITE INSPECTIONS ACTIVITIES

While padsite inspection prioritization and frequency has not been established, Modern has utilized the following assumptions to develop scope and costs estimates for this task.

Detail	Priority*	Frequency	Wells	Annual Inspections
<300' from sensitive use (18%)	High	2x/year	54	108
>300' to 1,000 from sensitive use (45%)	Moderate	1x/year	131	131
>1,000' from sensitive use (37%)	Low	1x/2 years	109	55
		Padsite Totals:	*131*	*131*
		Well Totals:	*294*	*294*

Remarks:

**Final priority definitions/distances to be set with City during completion of Task 1*
Assumes average of 2.25 wells per padsite (based on review of provided data)
Assumes frequency as noted above

Prior to initiating inspection activities, Modern will develop individual padsite maps within GIS to allow more efficient inspection efforts (Task 1). Additionally, we will assign unique values to each well, separator, and aboveground storage tank (AST) to allow clear reporting of concerns to operators. These maps will be included with each padsite inspection report. Based on discussions with the City, it is anticipated that a checklist to allow general inspection observations (i.e., code compliance) will be developed with the City during Task 1. Modern has developed a sample Padsite Inspection Report template with the operational requirements and environmental hazard assessment criteria included. A sample report is provided for reference.

In addition to a review of prior inspections results, Modern will utilize monitoring equipment consistent with industry standards to identify environmental hazards (e.g., radiation) and leaks. Monitoring during padsite inspections and air monitoring anticipates the use of the following equipment.

Instrument Detail	Equipment Resolution
Optical Gas Imaging Camera (FLIR)	3,000 – 5,000 ppmv (as methane)
Radiation Meter (NORM)	1 µR/hr
Methane Meter (Infrared)[1]	1 ppmv
Hydrogen Sulfide (H_2S) Meter[1]	0.003 ppmv
Photoionization Detector [Total VOCs (tVOCs)][1]	0.001 ppmv
Noise Meter (Class 1 microphone with A, C and Z weighting and 1/3 octave filters)[2]	1 dB
Particulate Matter (PM) as $PM_{2.5}$, PM_{10}, Total[2]	1 ug/m^3
Continuous AQM (Ozone, Methane, H_2S, PM, tVOCs)[3]	Variable
VOC analysis using EPA Method TO-14/TO-17 [3]	1 ppbv
Others[3]	As needed

1- *Fenceline monitoring at moderate and high priority sites anticipated to include collection of this data (up and down wind)*
2- *Fenceline monitoring at high priority padsites (i.e., nearest sensitive receptors) anticipated to include collection of this data*
3- *Optional equipment not currently within standard production monitoring proposal. Typically utilized when an air quality issue is identified or during drilling/flowback monitoring.*

Site Access

Modern will coordinate with City staff and operator representatives to obtain access to each padsite for inspection. This will include a summary letter explaining the inspection approach to be used by Modern and personal protective equipment (PPE) to be utilized. Our PPE includes Flame Resistant Clothing (FRC) worn during access to areas where flammable environments are anticipated and OSHA HAZWOPER training for all staff entering a padsite for inspection purposes. It is anticipated that the services will be performed under Level D safety requirements and no other protective gear is required. All work will be performed under a detailed health and safety plan.

Near-Equipment Inspection

During the inspection event, Modern will perform an Audio, Visual, and Olfactory (AVO) field inspection data as well as record monitoring results with the use of optical gas imaging systems (e.g., FLIR cameras) to identify leaks and radiation meters to confirm NORM conditions at selected equipment. The goal of near-equipment inspection activities is to evaluate operational conditions of well heads, well connections, flanges, valves, pumps, well head fluids (i.e., corrosion inhibitors), production piping, visible system pressure gauges, separator systems, secondary containment integrity, above-ground storage tanks (i.e., thief hatch, ventilation), fluid disposal transfer points, compressor systems, chemical storage areas, and obvious signs of staining, spills, or releases.

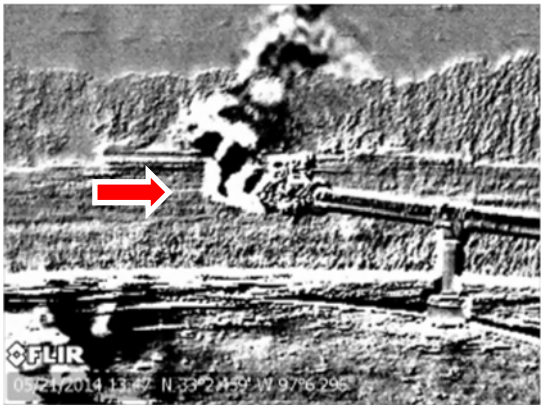
Fenceline Inspection

During the inspection events for moderate and high priority sites, Modern will perform an evaluation of both apparent up and downwind conditions at the padsite fenceline to allow record of site conditions in our inspection report. We will include an evaluation of methane concentrations, radiation, hydrogen sulfide, and total VOCs for moderate and high priority sites. For high priority sites we will include noise and particulate matter monitoring as well. Collection and analysis of air samples for individual VOCs can be included if requested, but is not within our current scope.

Our leak definitions are set at either positive visual observation with the OGI equipment, or if accessible, direct measurement for quantification. An example of our proposed leak definition thresholds are outlined in the example report attached to this proposal.

The leak/exceedance references represent non-ambient conditions that would typically indicate a significant contribution of COC emissions from production equipment. Normal intermittent operation of pneumatic equipment would not be considered a leak. If a continuous leak is identified and operator permission granted, we can tag the leak to allow easy identification after the field event. When a leak is associated with a low-bleed device, we will request manufacturer documentation so this is recorded in the report and not reported as a leak.

View of OGI efforts during a padsite inspection event.



Example of leaking pressure control valve from a tank battery system.

Example of infrared methane monitoring after a leak has been identified with the OGI equipment.

Example of tagged equipment in need of repair or replacement.

TASK 3: REPORTING

Monitoring reports will be prepared following each inspection event that outline the inspection methods, equipment inspected, monitoring results, and photos depicting any tagged leak under normal and OGI formats. Additionally, a site map showing the general layout and equipment locations during the monitoring event will be prepared. When the inspection is completed an email conveying the report and summary of leaks will be submitted to the City for communication with the operator and suggested period for re-inspection.

Upon completion of all annual activities, Modern will prepare a comprehensive summary report with our inspections analytics and recommendations for programmatic improvements. The goal of the annual summary report is to provide the City with a snapshot understanding of current well/padsite operating conditions and highlight those requiring corrective action or where health and safety concerns may be present.

TASK 4: CONTINGENCY SAMPLING, RE-INSPECTION AND NON-INSPECTION TECHNICAL SUPPORT

Modern has included contingency sampling for individual VOCs and hydrogen sulfide within this task. If field monitoring with discrete sampling at the fenceline identifies conditions indicative of elevated VOCs or hydrogen sulfide, Modern will collect a time-weighted sample for evaluation of VOCs using EPA Method TO-17 and/or hydrogen sulfide using ASTM Method D5504. Modern will bring contingency sampling equipment on all high and moderate sampling events.

The current inspection and reporting process assumes the operator will be responsible to address leaks or action items noted during the inspection event. However, Modern has included contingency costs for the performance of re-inspection events should verification be required. Additionally, unit rates for other inspection efforts and technical support outside of padsite inspection has been included under this task.

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ESTIMATED BUDGET

Modern will perform the above described scope of services for a time and materials/unit rate fee as presented below. The total not-to-exceed estimate for Tasks 1-3 is **$238,333.** *Contingency costs are included for elements of Task 4 as unit costs for future authorization on an as needed basis.*

ESTIMATED PROJECT BUDGET	
TASK 1: RECEPTOR SCREENING, INSPECTION PRIORITIZATION, AND PROGRAM TECHNICAL SUPPORT	
Consulting Labor	$ 5,000
Padsite Figure Development ($125/padsite; 131 padsites)[1]	$ 16,333
Expenses	$ 1,500
Subtotal:	*$ 22,833*
TASK 2 & 3: ANNUAL PADSITE INSPECTION AND REPORTING	
High Priority Padsites (54 Wells Anticipated)[2]	
➢ *Near Equipment Inspection: FLIR OGI, NORM*	
➢ *Fenceline Inspection: Methane, NORM, Hydrogen Sulfide, tVOCs, Noise and Particulate Matter*	
Consulting Labor and Expenses per well inspection:	$ 765
Total No. of wells inspected annually:	108
Subtotal:	*$ 82,620*
Moderate Priority Padsites (131 Wells Anticipated)[2]	
➢ *Near Equipment Inspection: FLIR OGI, NORM*	
➢ *Fenceline Inspection: Methane, NORM, Hydrogen Sulfide, tVOCs*	
Consulting Labor and Expenses per well inspection:	$ 705
Total No. of wells inspected annually:	131
Subtotal:	*$ 92,355*
Low Priority Padsites (109 Wells Anticipated)[2]	
➢ *Near Equipment Inspection: FLIR OGI, NORM*	
Consulting Labor and Expenses per well inspection:	$ 555
Total No. of wells inspected annually:	55
Subtotal:	*$ 30,525*
Annual Summary Report (Comprehensive Data Presentation)	*$ 10,000*
Total Program and Inspection Costs (Tasks 1-3):	***$238,333***

ESTIMATED PROJECT BUDGET (CONT'D)

TASK 4: CONTINGENCY SAMPLING RE-INSPECTION AND NON-INSPECTION TECHNICAL SUPPORT (AUTHORIZED AS NEEDED)

Contingency Sampling (Includes all sample kits, equipment, analysis)	
VOC Analysis using EPA Method TO-17M	$ 135/ea
Hydrogen Sulfide using ASTM D5504	$ 285/ea

Re-Inspection Service Items[5]		
Item (Labor and Expenses included)	Comb.[3]	Ind.[4]
Leak Re-inspection (FLIR OGI)	$200	$600
Noise Monitoring	$150	$500
Re-Inspection of Environmental Hazard (tVOC, NORM, H_2S)	$150	$500
Air Sampling up and downwind of padsite for VOC analysis as well as PM, H_2S, NORM, Methane, and tVOCs	$500	$1,000

Technical/Field Support and/or Data Processing[5]	
Program Manager	$ 150/hr
Project Engineer	$ 165/hr
Project Manager	$ 135/hr
Project Scientist	$ 95/hr
GIS/CAD Support	$ 85/hr
Administrative	$ 65/hr
Other services, extended monitoring events, water/soil sample analysis (project specific)	TBD
Expenses (project specific)	TBD

1- *Costs anticipated to be a one-time event per padsite. Once all padsites have been documented updating costs will be within inspection fees.*

2- *Costs assume per well basis the time to coordinate site visits, prepare GIS data, complete field inspection, record field observations, and prepare padsite report. Includes all field and equipment expenses.*

3- *Cost if activity performed in combination with other field inspection efforts. Schedule will be dependent on project activities. Assumes less than 1.5 hours of field time at each event and use of noted equipment.*

4- *Cost if activity performed in independent of other field inspection efforts. Schedule will be prioritized to meet City goals. Assumes less than 1.5 hours of field time at each event and use of noted equipment.*

5- *Cost for non-inspection efforts during normal business hours (M-F 8am to 5pm). If support required outside these hours, the normal rate or inspection unit costs would be charged at 2x the presented rate.*

PROJECT SCHEDULE

Modern is ready to begin project activities immediately following authorization. Key steps are outlined below with anticipated completion schedules.

Step	Description	Completion
1	Project kickoff meeting with City staff	10 days from authorization
2	Confirm inspection prioritization goals and inspection frequency. Develop GIS-based prioritization maps based on City criteria. Update the inspection schedules accordingly. Verify City operational inspection criteria (current checklist items).	15 days from City input and required GIS files for analysis
3	Finalize project budget based on results of Step 2.	5 days from Step 2 completion
4	Complete DRAFT padsite maps for all City padsites included in annual inspection effort (includes Low priority padsites – half of which will be addressed in Year 2).	15 days from Step 3 and revised budget authorization
5	Submission of padsite access request with outline of procedure and verification of access limitations	10 days from Step 4 completion
6	Completion of semi-annual and annual padsite inspections	Within 6 months of authorization by City (and Operator access)
7	Re-inspections/Operator repair confirmation	Concurrent with Step 6 through 1 additional month
8	Reporting (individual padsite reports)	Each inspection report will be submitted within 15 days of inspection event
9	Annual Summary Report and updated GIS layers with annual data results and outstanding action items.	Within 15 days from last report

ASSUMPTIONS AND LIMITATIONS

The following assumptions were made in preparing this proposal:

- The City will coordinate all access required to allow the above scope of work to be executed;
- Our work will be performed in a manner consistent with that level of care and skill ordinarily exercised by other members of our profession practicing in the same locality, under similar conditions and at the time the services are performed;
- Our conclusions, opinions and recommendations will be based on the information available for review. This will only include a limited number of observations and data points. It is likely that conditions will vary between or beyond the specific points evaluated; and
- Costs presented above are based on the estimated number of wells and the services proposed. If the scope of work or number of wells changes, the budget may need to be updated to reflect this change of condition.

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AUTHORIZATION

The City can engage us through the current purchase order system, issuance of a professional Services Agreement (PSA), or authorization of one or more of the outlined tasks.

CLOSING

We thank you for the opportunity to provide this proposal for environmental services and look forward to working with you as the need arises. If you have any questions or comments, please feel free to contact the undersigned at your convenience.

Respectfully submitted,

Zachary Tondre, MS, GIT
Project Scientist

Kenneth S. Tramm, PhD, PG, CHMM
Principal/Program Manager

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Texas Registered Geoscience Firm 50411
Texas Registered Engineering Firm F-16201

Attachment: Example Padsite Inspection Report

ANNUAL PADSITE INSPECTION REPORT

Padsite Name: *Example Farms & Family Trust Padsite (#34)* ***Operator:*** *Example*
Inspection Date: *05/05/17* ***Inspector:*** *ZT/DW*

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Wells:

A- Ashmore Farms 1H (RRC ID: 197000)
B- Ashmore Farms 2H (RRC ID: 241000)
C- Family Trust 1H (RRC ID: 192000)
D- Family Trust 2H (RRC ID: 193000)
E- Family Trust 3H (RRC ID: 241000)

Inspection Summary:			
Equipment	**Leaks***	**NORM****	**Fenceline Results:**
Wells	0	0	Below Screening Goals
Separators	1	1	**Action Items:**
ASTs	0	0	None
Other	0	0	

*OGI leaks identified exclude operational low bleed components
**NORM exceeding 50 µR/hr (labeled or unlabeled)

OPERATIONAL REQUIREMENTS

Pass	Fail	N/A	City of Denton Checklist (DRAFT- Final to match ordinance/City criteria)
☒	☐	☐	**Item 1:** Signage Req: ☐ Operator Name; ☐ Address; ☐ Well Name; ☐ 24hr Phone; ☐ RRC/API No.s; ☐ No Smoking; ☐ Reflective/Lighting **Comments:** None
☒	☐	☐	**Item 2:** Proper Painting on all Wellheads, Tank batteries, Separators **Comments:** None
☒	☐	☐	**Item 3:** Equipment height criteria is compliant. **Comments:** None
☒	☐	☐	**Item 4:** Site layout criteria is compliant. **Comments:** None
☒	☐	☐	**Item 5:** Fire Dept. Req:☐ Fire Lane; ☐ Safety Valve; ☐ Tank Level Gauge; ☐ Accessible ESD; ☐ Tank Integrity; ☐ Tank Labels; ☐ Foaming Lines **Comments:** None
☒	☐	☐	**Item 8:** No refining plant or main line compression/cooling plant allowed. **Comments:** None
☒	☐	☐	**Item 9:** No flaring or burning allowed during production without approval. **Comments:** None
☒	☐	☐	**Item 10:** Each well has permanent signage with name/number of operator. **Comments:** None
☐	☐	☒	**Item 11:** Warning sign where pipeline crosses thoroughfare. **Comments:** None
☐	☐	☒	**Item 12:** Flow and gathering pipelines must be <300 psi unless otherwise approved. **Comments:** None
☒	☐	☐	**Item 13:** No flooding conditions created by well or pipeline. **Comments:** None
☒	☐	☐	**Item 14:** During production, wells and associated equipment must be screened with 6' solid/fenced walls that match surroundings. Locked gate for safety. **Comments:** None
☒	☐	☐	**Item 15:** ASTs no taller than 8' and painted an approved shade of green or non-contrasting soft earth tone color to match surroundings (per ord. 010-2011). **Comments:** None
☒	☐	☐	**Item 16:** Trees and shrubbery must be in good health. **Comments:** None
☒	☐	☐	**Item 17:** Gravel road or better with proper drainage at drive. **Comments:** None
☒	☐	☐	**Item 18:** AST berm designed to hold 150% of AST capacity. Lightning arrestor at each AST. **Comments:** None
☒	☐	☐	**Item 19:** "Fire access will be provided in accordance with all local, state and federal requirements." **Comment:** Knox Lock installed properly (as applicable)

LEAK/EXCEEDANCE DEFINITIONS

Operational Requirements					
Constituent:	Methane	NM VOCs	H_2S	NORM	Other: Noise
Criteria:	10,000 ppmv	500 ppmv	10 ppmv	50 µR/hr	N/A
Fenceline:	1,000 ppmv	0.1 ppmv	0.08 ppmv	50 µR/hr	70 dBA
Equipment	OGI Camera	PID	H_2S Meter	Radiation Meter	Sound Meter

INSPECTION RESULTS – WELLS

Location ID:	Leaks (OGI):	NORM (µR/hr; max):	Date Reported[1]:	Date Addressed[2]:
Well A	None	<15	NA	NA
Well B	None	<15	NA	NA
Well C	None	<15	NA	NA
Well D	None	<15	NA	NA
Well E	None	<15	NA	NA
General Notes: No other concerns noted.				

INSPECTION RESULTS – SEPARATORS

Location ID:	Leaks (OGI):	NORM (µR/hr; max):	Date Reported[1]:	Date Addressed[2]:
Separator A	None	150	NA	NA
Separator B	None	<15	NA	NA
Separator C	None	<15	NA	NA
Separator D	Compression Fitting	<15	05/05/17	05/05/17
Separator E	None	<15	NA	NA
General Notes: No other concerns noted.				

INSPECTION RESULTS – TANK BATTERY (ASTS)

Location ID:	Leaks (OGI):	NORM (µR/hr; max):	Date Reported[1]:	Date Addressed[2]:
Tank A	None	45	NA	NA
Tank B	None	<15	NA	NA
Tank C	None	35	NA	NA
Tank D	None	<15	NA	NA
Tank E	None	<15	NA	NA
General Notes: No other concerns noted.				

INSPECTION RESULTS – COMPRESSORS OR ANCILLARY EQUIPMENT

Location ID:	Leaks (OGI):	NORM (µR/hr; max):	Date Reported[1]:	Date Addressed[2]:
Ancillary A	None	<10	NA	NA
Ancillary B	None	<10	NA	NA
Ancillary C	None	<10	NA	NA
Compressor A	None	<10	NA	NA
General Notes: No other concerns noted.				

[1] – Reported to operator
[2] – If reported to Modern by operator
**NORM exceeding 50 µR/hr not labeled.*

Leaks identified using OGI will typically require methane in excess of 3,000 ppmv (0.3% by volume) and can be suggestive of concentrations in excess of the lower explosive limit (50,000 ppmv or 5% by volume). Additionally, the American Conference of Governmental Industrial Hygienists (ACGIH) has assigned an 8-hour threshold limit value (TLV) of 1,000 ppmv (0.1% by volume) due to its potential for cardiac sensitization and central nervous system depression. Based on these factors, a leak noted by OGI will be considered an "environmental or personal hazard" requiring action by the operator for repair unless determined by the operator to be the result of normal operations. Modern will tag leaks to allow later identification if authorized by the operator.

PERIMETER ENVIRONMENTAL HAZARD ASSESSMENT

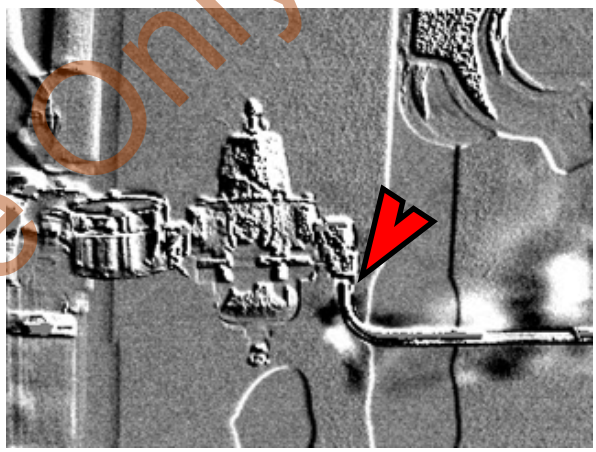
Met. Data			Wind Direction (to): NE	Wind Speed (mph): 4.5	Bar. Pressure ("Hg): 30.14
			Avg. Temp (°F): 75.2	Humidity (%): 39.9	Precipitation: N/A
Pass	Fail	N/A	Operational Requirements (Ordinance No. 0801-04) Item Q25		
☒	☐	☐	**Perimeter PID readings <100 ppbv**	**Upwind Comments:** Result: <1 ppbv	**Downwind Comments:** Result: <1 ppbv
☒	☐	☐	**Perimeter Radiation <50 µR/hr**	**Upwind Comments:** Result: <15 µR/hr	**Downwind Comments:** Result: <15 µR/hr
☒	☐	☐	**Perimeter H_2S <80 ppbv**	**Upwind Comments:** Result: <5 ppbv	**Downwind Comments:** Result: <5 ppbv
☒	☐	☐	**Perimeter Methane < 1,000 ppmv**	**Upwind Comments:** Result: <1 ppmv	**Downwind Comments:** Result: <1 ppmv
☒	☐	☐	**Noise Monitoring:** (Goal: <70dBA at 100' from padsite) **Exceed Goal:** No	**Perimeter Result**[1]: 55.4 dBA (<5-minute sample) Secondary Result at 100' from perimeter: N/A dBA **File #:** 011 **Comments:** None	
☒	☐	☐	**Other perimeter observations suggestive of releases to air, surface or groundwater.** **Comments:** None		

[1]Perimeter monitoring occurred at the fenceline closest to an adjoining occupied structure. If an exceedance is noted at this point, a secondary monitoring event is conducted approximately 100 feet from perimeter toward the nearest occupied structure.

No. 1 View of padsite entrance with well signage and Knox Lock.

No. 2 View of on-site compressor and acoustic wall.

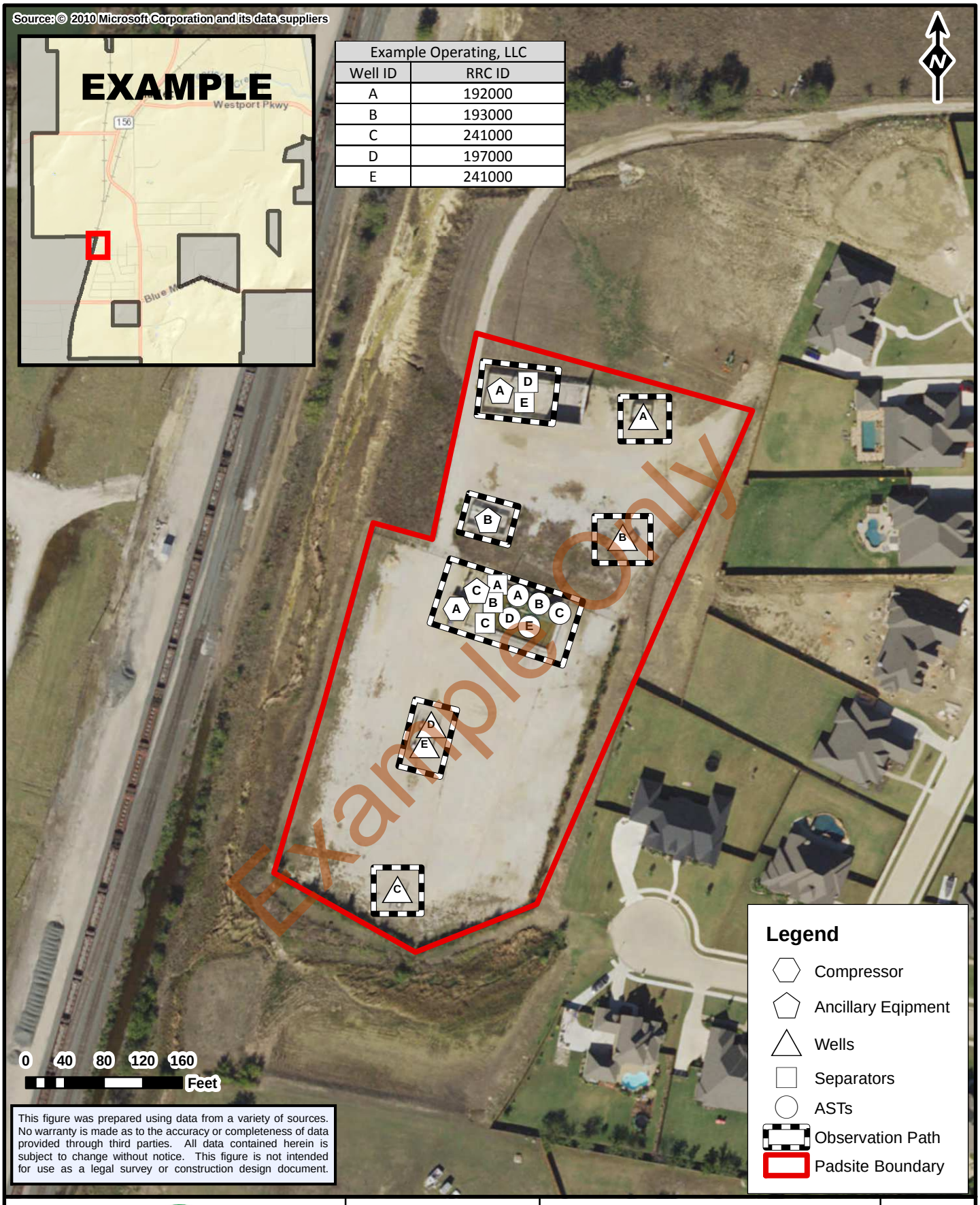
No. 3 Leak observed at a compression fitting on Separator D.



No. 4 Leak observed at a compression fitting on Separator D shown in HSM.

No. 5 View of OGI operation at leak observed on Separator D.

No. 6 View of NORM labeled separator (A).



MODERN GEOSCIENCES
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PROJECT NO.	17018
DRAWN:	05.05.17
DRAWN BY:	LM
CHECKED BY:	KT
FILE NAME:	Haslet_34_BT_050517.mxd

SITE MAP

Example Trust/Family Farms Padsite (No. 34)
Example, Texas

FIGURE
1