

TRANSITION PLAN FORMER
FARMLAND INDUSTRIES
NITROGEN PLANT 1608 NORTH
1400 ROAD LAWRENCE, KANSAS
CONSENT ORDER NO. 10-E-94 BER

Prepared for

Kansas Department of Health and Environment
Curtis State Office Building
1000 SW Jackson, Suite 410
Topeka, Kansas 66612-1367

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City of Lawrence

6 E. 6th Street
PO Box 708
Lawrence, KS 66044

TABLE OF CONTENTS

1.	Section 1 ONE Introduction	1-1
2.	Section 2 TWO Purpose and Objectives.....	2-1
3.	Section 3 THREE Project Team and Contact Information.....	3-1
	3.1 City of Lawrence.....	3-1
	3.1.1 Project Coordinator’s Representative	3-1
	3.1.2 Project Manager	3-1
	3.1.3 Environmental Technician	3-2
	3.2 Contact Information	3-3
4.	Section 4 FOUR Description of Continued Operation of Current On-Site Sampling and Remedial Systems	4-1
	4.1 Groundwater Monitoring Network	4-2
	4.1.1 Groundwater Containment System	4-2
	4.1.2 Groundwater Recovery Wells.....	4-2
	4.1.3 Groundwater Monitoring Wells.....	4-2
	4.2 Land Application Program.....	4-3
	4.3 Interceptor Trench System.....	4-4
	4.4 CRS Unit and Monitoring.....	4-4
	4.5 Stormwater Management and NPDES Monitoring	4-5
	4.6 Required Permit Reporting and Schedules	4-6
	4.7 Soils and Sediment Remedial Actions.....	4-8
	4.7.1 Sandstone Hill Soils.....	4-8
	4.7.2 Central Ponds Sediments	4-8
	4.7.3 Dam Pond Sediments.....	4-9
	4.7.4 Krehbiel and West Pond Sediments.....	4-9
	4.7.5 Area A and Area D Soils	4-9
	4.7.6 Closure of Area B Ponds.....	4-10
5.	Section 5 FIVE Dismantling/Demolition of Remaining Above Ground Structures.....	5-1
	5.1 Introduction of Soil-Waste Management Plan.....	5-1
	5.2 General Use of the SWMP.....	5-1
6.	Section 6 SIX Soil-Waste Management Plan	6-1
	6.1 Soil-Waste Management Plan Implementation	6-1
	6.2 Intrusive Activities/Excavated Soils	6-1
	6.2.1 Intrusive Activity Notification and Intrusive Activity Plan.....	6-1
	6.2.2 Soil Characterization.....	6-2
	6.2.3 Management and Storage of Soil Waste.....	6-3
	6.2.4 Disposal of Soil Waste.....	6-3

TABLE OF CONTENTS

6.3	Demolition Debris and Materials.....	6-4
6.4	Waste Materials and Unknown Materials.....	6-5
6.5	Contact Information.....	6-6
7.	Section 7 SEVEN References.....	7-1

Figures

Figure 1-1	Site Location Map
Figure 3-1	Project Organization Chart
Figure 4-1	Remedial Management Areas
Figure 4-2	Interceptor Trench and Recovery Well Locations
Figure 4-3	Current Land Application
Figure 4-4	Monitoring Well Location Map
Figure 4-5	General Storm Water Flow and Sampling Point Locations
Figure 6-1	Sandstone Hill Extent of Soil Above RSK Standards for Nitrate and Ammonia
Figure 6-2	Ammonium Nitrate Production Area Soils Above RSK Standards for Nitrate and Ammonia
Figure 6-3	Area D Soils Above RSK Standards for Nitrate and Ammonia
Figure 6-4	Summary of LURS and Administrative Controls
Figure 6-5	Intrusive Activity Notification and Approval Procedures
Figure 6-6	Procedure for Soil Generated from Intrusive Activities
Figure 6-7	Procedure for Demolition Debris/Materials
Figure 6-8	Procedure for Discovery/Generation of Waste

This Transition Plan has been developed for the former Farmland Industries Nitrogen Plant (Site) located at 1608 North 1400 Road, Lawrence, Kansas (**Figure 1-1**). The plan was required by Consent Order (CO) Case No. 10-E-94 BER from the Kansas Department of Health and Environment (KDHE). The CO was signed by the City of Lawrence (Respondent) on June 21, 2010 as part of the Respondent's acquisition of the property from the Farmland Industries Kansas Remediation Trust (Remediation Trust). The effective date of the CO was September 29, 2010.

Under the CO, the Respondent agrees to be responsible for the required remediation and the obligations and requirements of the CO, including the continued operation and maintenance of all active remediation systems, as well as all reporting requirements of the Resource Conservation and Recovery Act (RCRA) and National Pollutant Discharge Elimination System (NPDES) permits for the Site. Current active remediation systems include all groundwater recovery wells, sumps, interceptor trenches, above ground storage tanks and all other systems related to the hydraulic containment and land application of contaminated groundwater and/or surface water.

Provided in this plan is detailed information on the project team assembled by the Respondent to complete the remedial actions required by the CO and presents the Soil and Waste Management Plan developed for the Site. This Transition Plan includes the following elements:

- Section Two Purpose and Objectives
- Section Three Project Team and Contact Information
- Section Four Description of Continued Operation of Current On-Site Sampling and Remedial Systems
- Section Five Soil-Waste Management Plan
- Section Six Soil-Waste Management Plan Implementation
- Section Seven References

The purpose of this Transition Plan, described in Section IV, Paragraph C of the CO, is to provide the following:

- A description of the project team the Respondent has assembled to complete environmental work required by the CO, including contact information for key project team members.
- A description of the continued operation and maintenance of all current on-site remediation systems including the land application system, and continued monitoring requirements under the RCRA Permit for the Chromium Reduction System (CRS), NPDES Permit, and other environmental requirements.
- A Soil-Waste Management Plan.

This Transition Plan must be approved by KDHE prior to demolition or other activities under the CO. The objectives of this Transition Plan include the following:

- To comply with Section IV, Paragraph C of the CO by submitting a Draft Transition Plan to KDHE within 30 days of the effective date of the CO, July 29, 2010.
- To demonstrate that the Respondent has assembled a qualified team and effective organization to complete the work and meet the schedule requirements in the CO.
- To effectively transition environmental work from the Remediation Trust to the Respondent's team and support the Remedial Design/Remedial Action (RD/RA) activities required by the CO.
- To provide for long-term management of impacted soil and waste materials encountered during redevelopment of the Site.

This section presents a description of the project team which will be completing the work required by the CO. The team includes personnel from the City of Lawrence who will work together to meet the requirements of the CO.

The project organization chart identifying key personnel, responsibilities, and lines of authority between the Respondent and contractors/consultants is presented on **Figure 3-1**. A description of the roles and responsibilities of key project personnel for the respondent are described in the following sections.

3.1 City of Lawrence

This section presents a general description and overview of the roles and responsibilities of the key City of Lawrence personnel who are part of the overall project team and who will be responsible for the obligations and requirements of the CO. Mr. David Corliss is the Project Coordinator for the Respondent according to the CO. It should be noted that other personnel will play a role on the project on an as needed basis.

3.1.1 Project Coordinator's Representative

Mr. Charles Soules, P.E. will be the Project Coordinator's Representative for the City of Lawrence for this project and will report directly to the designated CO Project Coordinator. The Project Coordinator's Representative duties and responsibilities include, but are not strictly limited to, the following:

- Overall responsibility for the procedures and requirements set forth in the CO
- Overall responsibility for meeting the Project Deliverable and Milestone Schedule set forth in the CO (Exhibit 4)
- Prepare and submit annual Budget & Expenditure Reports to KDHE, per the CO
- Execute the payment from the City to KDHE within 30 calendar days from the receipt of the accounting of oversight costs incurred by KDHE with respect to the CO
- Project management support
- Overall responsibility for the success and proper execution of the Contract requirements with the City's selected contractors and consultants

3.1.2 Project Manager

Mr. Matt Bond, P.E. will be the Project Manager for the Respondent for this project. Mr. Bond reports directly to the Project Coordinator's Representative and will represent the City of Lawrence in all project related activities. The Project Manager duties and responsibilities include, but are not strictly limited to, the following:

- Ensure that all the procedures and requirements set forth within the CO are performed and followed accordingly, including compliance with all Site permits, implementation of the Final Corrective Action Decision (CAD) and any and all other remedial actions, as required by KDHE
- Ensure that the required CO reporting and document submittal requirements and schedule to KDHE are met

- Ensure that the required Project Deliverable and Milestone Schedule set forth in the CO is met (Exhibit 4)
- Submit appropriate schedule extension requests, as necessary, to KDHE for approval
- Prepare and submit written quarterly progress reports to KDHE
- Prepare and submit all field activity notification forms, as required, to KDHE
- Prepare and submit EUC permits as necessary
- Coordinate the demolition of selected structures and related support systems at the Site
- Establishing, tracking and maintaining the overall project schedule, in accordance with the requirement of the CO
- Provide direction to the Environmental Technician
- Aid the Environmental Technician in the preparation of all monthly, semi-annual and yearly reporting requirements as stated in the CO

3.1.3 Environmental Technician

Mr. Allen Rogers will be the Environmental Technician for the City of Lawrence for this project. Mr. Rogers reports directly to the City of Lawrence Project Manager and will assist with the day to day activities on site. The Environmental Technician duties and responsibilities include, but are not strictly limited to, the following:

- Respond to requests for access to the Site
- Assist in the coordination of demolition Contractors work on site
- Continue the required monitoring and operation and maintenance practices currently in practice at the Site
- Maintain pumps in wells and trenches
- Maintain sanitary sewer system (Imhoff tank/UV System)
- Sampling and analyses of water samples
- Coordination of required activities associated with the Land Application Program
- Preparation of all monthly, semi-annual and yearly reporting requirements as stated in the CO
- Preparation of project planning documentation including field sampling and analysis plans and health and safety plans.
- Data review and analysis

SECTION THREE

Project Team and Contact Information

3.2 Contact Information

Presented below is a summary of the contact information for the key members of the project team:

Name	Title	Organization	Telephone Number	Email
Mr. Chuck Soules, P.E.	Project Coordinator's Representative	City of Lawrence	785-832-3132 785-760-0980 Cell	csoules@lawrenceks.org
Mr. Matt Bond, P.E.	Project Manager	City of Lawrence	785-832-3142 785-764-3634 Cell	mbond@lawrenceks.org
Mr. Allen Rogers	Environmental Technician	City of Lawrence	785-331-5066 Cell	arogers@lawrenceks.org

Various corrective actions have previously been implemented and continue to operate across the Site including various soil and groundwater remedial techniques, both as interim measures and components of the overall Site remedy. The Remedial Action Plan (RAP) (Shaw, 2009) evaluated various remedial alternatives to address contamination at the Site. KDHE determined that the selected corrective actions, described in the Final Corrective Action Decision (CAD) (KDHE, 2010), will be protective of human health and the environment. The CAD (KDHE, 2010) described three categories of remedial actions that will be required to meet the remedial action objectives for the Site. Primary Remedial Actions, Redevelopment Actions, and Secondary Remedial Actions. The remedial actions required by the CAD include continuation of currently operating remedial systems and implementation of additional remedial actions. The primary remedial actions described in the CAD include the following:

- Continue operation and enhancement of the groundwater monitoring network;
- Continue operation and enhancement of the groundwater containment system including land application of impacted water;
- Record and file with the County Register of Deeds Office Land Use Restrictions to control future uses and activities at the Site; and
- Continue Post-Closure monitoring of the CRS in accordance with the requirements of the KDHE Bureau of Waste Management.

Redevelopment Actions to be implemented in coordination with future Site redevelopment plans and/or site remediation includes the modification of the infrastructure, operations, and maintenance of stormwater management systems to meet the needs of future redevelopment plans and maintain current NPDES requirements, as well as those incorporated into future NPDES permits. This includes removal of sludge from the East and West Effluent Ponds (**Figure 4-1**) so they can be used for future non-contact stormwater detention.

Secondary Remedial Actions to be implemented consist primarily of management of soils and the closure of the series of ponds in Area B (**Figure 4-1**). These activities include the following:

- Excavation and management of impacted soils in select areas of the Site to improve stormwater runoff quality;
- Excavation and management of impacted soils to accommodate future redevelopment or construction; and
- Final closure of the northern ponds, including the Overflow Pond.

This section provides a description of the current monitoring programs, remedial activities, and previously conducted interim measures that will be incorporated into the remedial alternatives described in the CAD, and additional activities to meet the priorities laid out in the CAD. These descriptions demonstrate an understanding of remedial actions the City of Lawrence will be required to complete through the RD/RA process. These descriptions reflect the current remedial systems and plans for the Site as developed in the CAD (KDHE, 2010). Through the RD/RA process, the City of Lawrence will develop and present detailed plans for the remedial actions that will be completed to meet the remedial action objectives developed for the Site. Some

changes in the remedial actions described in the CAD are likely as a result of the development of the RD/RA work.

Presented below are the descriptions of the current and planned remedial actions described in the CAD. The Respondent will continue to operate and maintain the current remedial systems in place as well as continue the current reporting requirements.

4.1 Groundwater Monitoring Network

4.1.1 Groundwater Containment System

The first priority described in the CAD is maintaining hydraulic control of groundwater impacted by nitrogen compounds utilizing the existing groundwater containment system, with enhancements, disposal of the impacted groundwater and stormwater through the existing land application system, and continued monitoring. Proposed enhancements to the existing groundwater containment system include the installation of an interceptor trench in the Central Ponds area to capture groundwater seepage that impacts surface water quality, the installation of a sump/pump system associated with the Dam Pond, and the installation of an alluvial aquifer pumping well north or northwest of the Bag Warehouse. Options for enhancement to the groundwater containment system will be reviewed in detail in the RD/RA Work Plan.

The groundwater containment system consists of various components installed and operated during the last 30 years. The locations of the interceptor trenches and recovery wells which make up the groundwater containment system, as well as the monitoring wells sampled are shown on **Figure 4-2**. The installation and operation of the various interceptor trenches and recovery wells over time was nominally determined to be effective in preventing the migration of nitrate and ammonia contaminated groundwater through hydraulic containment (**Shaw, 2009**).

No formal evaluation or optimization of the current groundwater containment system has been performed to date. An evaluation of the system will be completed during the RD/RA process.

4.1.2 Groundwater Recovery Wells

Currently, three wells, PSW-3B, PSW-6B and PSW-7B (**Figure 4-2**), operate as recovery wells to pump water from the Kansas River alluvial aquifer as part of the groundwater containment system. The pumps installed in the wells are continuously pumped to recover alluvial groundwater. Extracted groundwater is conveyed via a common discharge line from the three recovery wells to a combined discharge location. This water is directed to a NPDES permitted outfall, which flows to the Kansas River, at the north property boundary. The pumping of these wells has been considered adequate to maintain hydraulic control and containment of nitrogen compounds that may impact the Kansas River alluvial aquifer in the area north of the Area B ponds, (**Shaw, 2009**).

4.1.3 Groundwater Monitoring Wells

Currently there are nineteen wells that are used to monitor the groundwater quality along the north area of the property. These wells are shown on **Figure 4-4**. These wells are constructed in essentially two zones, nine being in the upper silty clay or overburden unit, while ten are completed in the lower or alluvial aquifer. These wells are monitored quarterly for water quality and water levels. This data is presented to the KDHE in a quarterly Performance Evaluation Report.

There are other monitoring wells located on the facility that are not actively used in the groundwater monitoring activities. All these wells will be preserved for potential future use unless the City of Lawrence and KDHE agree that the well(s) can be plugged and abandoned. All the wells located on the site will be identified and their location identified by GPS coordinates. All wells will be marked by stenciling the ID name on the well.

In the event that a well is damaged due to unforeseen circumstances, the City Project Manager and the KDHE Project Manager will be notified. Recommended plans for repairs, plugging and abandonment or replacement of the damaged well will be presented as part of the notification. The decision for action to the damaged well will be made by the City Project Manager with approval of the KDHE Project Manager.

4.2 Land Application Program

Currently, water from the Site that exceeds the NPDES permit limits is captured and stored for disposal through the Land Application Program. This volume of water includes extracted groundwater from the interceptor trench system and stormwater runoff. The stormwater runoff comes primarily from the northern portions of the Site where stormwater is impacted by surface soil and groundwater seeps that daylight as surface water. In most areas, this water contains lower concentrations of nitrogen compounds than the groundwater collected from the interceptor trench system.

Before the shutdown of the former Farmland Plant, nitrogen-impacted water was captured and recycled for use in the plant for production processes. Beginning in 2002, following shutdown of the plant, stormwater and recovered groundwater that contained concentrations of nitrogen compounds above the NPDES discharge permit levels were contained on-site in two existing aboveground storage tanks (AST) #5 and #6 as well as the Rundown and Overflow Ponds. Initially, this water was transported to agricultural fields located north of the Site and land applied on crops for beneficial use.

Since 2005, the water is pumped from these tanks through existing piping to agricultural fields north of the Kansas River (**Figure 4-3**) and applied to the fields via center pivots and or portable center pivots. The water is applied either prior to or shortly after planting of the crops in the winter and in the spring on two fields where sod is grown for harvest. The amount of water that a field can receive is dependent on several factors, including the concentration of nitrate in the soil and applied water, prevailing weather, and time in the growing season. The individual farmers, where the water is land applied, are contacted in the fall to discuss the potential needs for irrigation of crops and the potential application rates needed. Final application rates are calculated before land application activities commence as nitrogen concentrations are dependent on the current nitrogen levels in the targeted fields and the targeted yields the farmers have to their crops. Nitrogen application rates are based on yield goals set by the farm managers, and follow established agricultural guidelines presented by Kansas State University and KDHE for the application of biosolids to agricultural fields.

Requirements set forth in the Land Application Plan (Shaw, 2005) and in the NPDES permit include soil monitoring, water monitoring and yearly reporting. Prior to land application of water, a representative grab sample of the applied water and composite soil samples are collected

for analysis of agronomic parameters. The soil samples are collected, analyzed and evaluated by a Certified Crop Advisor. The analytical parameters and sample collection procedures (the number of soil samples required and the depths of the soil samples) are described in the current NPDES permit.

The current Land Application Plan (Shaw, 2005) as well as the soil, water and yearly reporting requirements, as stated in the current NDPEs permit, will continue to be followed by the City. At some point in the future, the amount of water used in the Land Application Program for the beneficial use of the nitrogen compounds will no longer be economically feasible due to the lower nitrate concentrations and the resulting increase in volume of water required to meet the desired application needs a farmer may need for their fields. An evaluation of the current Land Application Program and its longevity will be completed during the RD/RA process.

4.3 Interceptor Trench System

The interceptor trench system, proposed in the 1995 Corrective Action Study and designed in the 1997 Corrective Action Plan, was installed along and parallel to the northern property boundary (**Figure 4-2**). This interceptor trench system was designed to recover shallow nitrate-impacted groundwater perched below the Area B ponds. Two previously installed interceptor trenches are located farther west and parallel to the base of Sandstone Hill and were incorporated into the overall system. Groundwater accumulating in the interceptor trenches is pumped from five sumps which are part of the interceptor trench system. These sumps are shown on **Figure 4-2** and include:

- Northwest
- Northeast
- Southeast
- North and
- South

Prior to the facility closing, the water recovered from these trenches was returned to the Rundown Pond to provide makeup water for operations at the facility. Currently, the water is stored in the 6 million gallon AST and discharged through the Land Application Program. The pumps installed in the sumps are operated on a level-float system, and as groundwater recharges the pumps operate until the level-float switches the pumps off. Extracted groundwater is conveyed via a common two-inch high density polyethylene (HDPE) discharge line from the sumps to either the Overflow Pond or the ASTs. Depending on the status of the storage capacity of the ASTs, valves along the length of the discharge line can be used to route the water. Since fertilizer manufacturing operations have terminated at the facility, the water recovered from these trenches is pumped to and stored in the ASTs on-site as part of the Land Application Program. The water that is applied under the Land Application Program is sampled and reported on under the current NPDES permit, as discussed in **Section 4.2**.

4.4 CRS Unit and Monitoring

A CRS surface impoundment was operated at the Site from 1972 to 1984. Because the CRS Unit is subject to the provisions of RCRA, the KDHE Bureau of Waste Management has maintained

regulatory oversight independent of the remainder of the Site. Closure of the CRS was accomplished in 1986 and early 1987 under a RCRA Closure Plan approved by the KDHE. The acid and caustic ponds were also closed in 1987 with removal of pond liners, backfilling of the depressions and capping with native soils. A groundwater interceptor trench with a French drain was installed in 1986 and discharges to the surface drainage ditch that discharges to the Area B ponds.

The CRS Unit was unable to receive clean-closed status because chromium was detected at concentrations above acceptable limits and low pH was determined in the groundwater beneath the Site. A two part RCRA permit was jointly issued by the KDHE and USEPA Region VII in February 1993, with Part I being under KDHE authority for Post Closure and Corrective Action of the CRS and Part II under EPA authority for Site-wide Corrective Action. The scope of the Post Closure Care Permit (Permit No. KSD007128507) included corrective action and monitoring of the groundwater beneath the CRS Unit for both chromium concentrations and pH. **Figure 4-4** presents the locations of the monitoring wells that are sampled at the CRS Unit. Since the corrective action and monitoring was implemented, the chromium concentrations in groundwater declined to below the action level; however, the pH of the groundwater up-gradient of the interceptor trench is still below the acceptable range. The CRS unit continues to be subject to semi-annual post-closure monitoring according to the current Sampling and Analysis Plan (**Farmland, 2002**) and annual reporting, pending return of pH conditions in the groundwater to near neutral (between pH of 6 and 9).

4.5 Stormwater Management and NPDES Monitoring

During its years of operation the Site utilized water pollution control systems to reduce the amount of ammonia and nitrates that were discharged to an NPDES permitted outfall. Process waste streams and stormwater runoff from the urea and ammonium nitrate (UAN) production areas in Area A were collected in a series of lagoons/ponds located in Area B for reuse within the plants. When the manufacturing plant shutdown in 2001, the nitrate-impacted stormwater runoff could no longer be returned to the process. This nitrate-impacted runoff was subsequently directed to and stored in the Rundown Pond and Overflow Pond.

It will be necessary to continue to manage and monitor stormwater discharge from the Site until the water quality with respect to nitrogen running off the site is essentially the same as the water quality of water running onto the site or until KDHE determines that the water quality exiting the site is as good as can be expected and does not create or contribute to a surface water quality problem downstream of the discharge. These monitoring activities consist of sampling stormwater runoff during storm events and the analysis of the samples for ammonia-nitrogen and nitrate-nitrogen.

The primary area of the Site where stormwater continues to be impacted significantly by nitrogen compounds is within Area A at the north end of the Site. Area A continues to impact stormwater with contact to nitrogen impacted surface soils and nitrogen impacted groundwater that daylights as seeps. Stormwater runoff from the Sandstone Hill area drains in two different directions, to the north and northwest and to the south and southeast. The drainage to the north and northwest is impacted somewhat by surface soil impacts, but the primary impact is from groundwater seeps that daylight as surface water at several locations around the hill (**Shaw, 2009**). This surface water flows down a naturally occurring drainage ditch to the northwest and is captured at the

Dam Pond. The stormwater that flows from the Sandstone Hill to the south and southeast drains through the area of the former Central Ponds and around the south side of the ammonium nitrate process area. This stormwater combines with drainage from the process area and ammonium nitrate warehouse areas. Currently, this drainage can be discharged to the NPDES system or diverted to the contaminated water collection system.

The system that collects the nitrate-impacted stormwater in the ammonium nitrate process area consists of a series of surface drainage structures and underground drainage pipes that consolidate the runoff either to the north or the south of the process area. Four drain lines enter a catch basin at the West Pond in the southeast corner of the pond. These lines direct stormwater runoff to the West Pond from areas to the south. The stormwater runoff entering the West Pond from these lines contains concentrations of nitrogen compounds that are higher during low flow periods than during high flow events. A sump, pump and piping were installed where the underground drainage lines enter the catch basin. The piping allows for the stormwater to be pumped to the ASTs during low flow periods for use in the Land Application Program and directs the stormwater through the West Pond to the Krehbiel Pond during high flow periods.

A significant portion of the impact to stormwater draining from the Sandstone Hill is caused by groundwater seeps that come to the surface and are picked up by stormwater. Other impacts are related to the mobilization of nitrogen compounds from the surface soils by the stormwater. In 2002, in order to alleviate some of the surface water impacts, clean soils were spread over the Sandstone Hill area and grass was planted. In 2006, additional clean soils were transported to the top of the hill and spread in a layer approximately 6 inches deep, and native grasses were planted to reduce erosion and improve runoff control. Although these activities have been effective at reducing the impacts to stormwater, the groundwater seeps continue to have a detrimental impact on surface water quality in the Sandstone Hill area (**Shaw, 2009**).

The Site currently operates under a Kansas Water Pollution Control Permit (Permit No. I-KS31-P004) and is authorized to discharge accumulated stormwater and surface water under a NPDES permit. Stormwater from the Site is collected in West Effluent and East Effluent Ponds in Area B and is diverted to the main discharge point from the Site near the Bag Warehouse. There are four recognized outfall locations at the Site (**Figure 4-5**):

- 001A – Final discharge point from the Site to an unnamed tributary of the Kansas River
- 001B – Discharge from the Effluent Ponds to a surface drainage ditch
- 001C – Bypass drainage ditch past the Effluent Ponds inlet
- 001D – Imhoff Tank effluent to the Effluent Ponds

Daily volume monitoring is performed at each of the four outfalls. Weekly monitoring is performed during discharge at Outfall 001B, the discharge from the Effluent Pond. Discharge limitation concentrations apply to this outfall location and are described in the permit.

4.6 Required Permit Reporting and Schedules

The City's Environmental Technician will prepare and submit the required permit reports on behalf of the Respondent. The following reports will continue according to the current permit requirements.

SECTIONFOUR

Current On-Site Sampling and Remedial Systems

NPDES Permit (I-KS31-PO04)

- The NPDES permit includes the three extraction wells (and any future extraction wells) that are discharged directly to the NPDES outfall. If the discharge from any of these wells exceeds 2 mg/l NH₃-N or 10 mg/l NO₃-N, a letter report will be submitted to KDHE Bureau of Water (BOW) (Ed Dillingham) Technical Services Section.
- Monthly Discharge Monitoring Reports (DMR's) of the actual NPDES discharges from the effluent system will continue to be submitted to the KDHE via e-mail using software reporting program provided by KDHE.
- Annual NPDES/Stormwater Monitoring and Management Plan Report required by NPDES permit (Section 2 of Supplemental Conditions). The report will summarize the implementation of the Stormwater Pollution Prevention Plan for stormwater runoff associated with demolition, remediation and construction activities, routine surface water sampling, etc. This is a new report-has never been submitted previously. This report will be submitted to BOW by March 28 of the following year.
- Annual Closure Status Report (Section 13 of Supplemental Conditions) is an annual report that summarizes the BOW related closure activities from the previous year and projections for future closure activities. This also is a new report and has not been submitted previously.
- Annual Land Application Report for the previous calendar years soil and water results. The calculations for the amount of water applied in the previous calendar year and the planned water application for the upcoming year. This report will continue to be submitted to KDHE Bureau of Water (Eric Staab) by March 28 of the following year. A copy will be provided to KDHE Bureau of Remediation (BER) (Pamela Green).

Bureau of Environmental Remediation

- A quarterly report of the monitoring well network called the "Performance Evaluation Report" and will be submitted to KDHE BER (Pamela Green) and EPA Region VII (Kurt Limesand). The report describes the groundwater monitoring system at the north end of the facility, water elevations, groundwater concentrations, the recovery of groundwater, and the land application activities for that quarter.

RCRA Post Closure Care Permit (KSD007128507)

- Annual Groundwater Monitoring Report for the sampling at the CRS Unit monitoring wells will continue to be submitted to KDHE Bureau of Waste Management (Brad Roberts) and EPA Region VII (Kurt Limesand) by February 28 of following year. A copy will be provided to KDHE BER (Pamela Green).
- A report that presents the semi-annual groundwater monitoring data and groundwater levels for the CRS unit monitoring wells along with field notes will continue to be submitted to KDHE Bureau of Waste Management (Brad Roberts) and EPA Region VII (Kurt Limesand) within 30 days after each sampling event. A copy will be provided to KDHE BER (Pamela Green).

4.7 Soils and Sediment Remedial Actions

In both the RAP and CAD, impacts to soils and sediments are addressed as Secondary Remedial Actions to be completed at the Site. These actions include the following:

- Excavation and management of impacted soils in select areas of the Site to improve stormwater runoff quality;
- Excavation and management of impacted soils to accommodate future redevelopment or construction; and
- Final closure of the northern ponds, including the Overflow Pond.

4.7.1 Sandstone Hill Soils

The remedial alternative described in the CAD for the Sandstone Hill Soils (Former UAN Storage Area) is limited excavation of surface soils with nitrate plus ammonia concentrations greater than 1,000 mg/kg. This alternative for soil impacts in the Sandstone Hill area includes the selective removal of the highest concentrations in surface soil (0 to 2-foot depth). The approximate area for removal is 4.2 acres to an approximate depth of 2 feet, resulting in the potential removal of approximately 13,500 cubic yards of soil. Excavated soil would be placed in the Area B ponds, and backfill material would be procured on-site. On-site treatment of the impacted soil will be evaluated during the RD/RA.

4.7.2 Central Ponds Sediments

In 2006 nitrogen-impacted soils were excavated from the Central Ponds and placed in the East Lime Pond in Area B. Approximately 1,300 cubic yards of impacted sediment were removed from the Central Ponds by excavating to the bedrock interface at a depth of approximately 3 feet. The excavated material was transported to the East Lime Pond in Area B of the Site where it was placed in the south end. Approximately 2,700 cubic yards of backfill material, obtained on-site, were used to restore the surface grade to eliminate future accumulation of surface water and the resulting deposition of sediments.

This interim remedial measure performed in the Central Ponds is consistent with the proposed final remedy for the Site. Removing sediments containing high concentrations of total nitrogen improved the water quality of surface water exiting the Central Ponds area.

However, subsequent to the completion of the interim remedial measures of the Central Ponds, the area of the Central Ponds has been observed to contain occasional standing water. The water quality of surface water is negatively impacted, particularly during the initial flow of a precipitation event. As a result, backfill brought in during the interim remedial measure was impacted by this impacted water. The Central Pond Area, therefore, remains as a source area for nitrate and ammonia and was identified for additional action in the CAD.

The CAD states that an interceptor trench be installed as a primary remedial action up-gradient of the former Central Pond Area to capture the seeping groundwater and direct it to the land application program. Following the installation of the interceptor trench and elimination of the surface seep source, the surface soils in the Central Pond Area would be excavated and transported to the Area B ponds for disposal. Approximately 2,500 cubic yards of soil are anticipated to be removed from approximately 0.5 acres to a depth of three feet. Excavated soil

would be placed in the Area B ponds, and backfill material would be procured on-site. On-site treatment of the excavated soil will be evaluated during the RD/RA.

4.7.3 Dam Pond Sediments

A surface water drainage rill present in the far northwest part of Area A has been the subject of environmental investigation since the 1970's. As a result of the findings of these investigations, a dam was constructed in the early 1990's near the bottom of the drainage rill to retain impacted stormwater. Drainage of the accumulated water was directed by piping to the Krehbiel Pond at the west end of Area B. The CAD indicated the sediments within the footprint of the pond (approximately 90 feet by 50 feet) will be excavated to an approximate depth of 2 feet, resulting in the removal of approximately 350 cubic yards of sediment. Excavated soil would be placed in the Area B ponds, and backfill material would be procured on-site. On-site treatment of the excavated soil will be evaluated during the RD/RA.

4.7.4 Krehbiel and West Pond Sediments

The Krehbiel Pond, which also intermittently receives surface water runoff from the northwestern region of Area A, was excavated to a depth of 4 feet below existing grade or to bedrock as part of the 2006 interim remedial measures activities. Approximately 4,200 cubic yards of impacted sediment were removed and deposited in the East Lime Pond. Approximately 2,700 cubic yards of fill material were used to restore the ground surface for proper surface water flow and erosion control.

The West Pond previously contained sediments impacted by nitrates and ammonia; therefore, as part of the 2006 interim remedial measures activities, the pond was excavated to an approximate depth of 4 feet below grade. Approximately 2,750 cubic yards of impacted sediment were removed and placed in the East Lime Pond in Area B. Approximately 2,200 cubic yards of fill material were used to restore the ground surface for proper surface water flow and erosion control. A corrugated galvanized steel pipe was installed across the floor of the pond to segregate and divert impacted stormwater from the clean backfill material that was placed within the pond boundaries.

The interim remedial measures performed in the Krehbiel and West Ponds are consistent with the proposed final remedy for the Site. Removing sediments containing high concentrations of total nitrogen improved the water quality of surface water exiting this area.

4.7.5 Area A and Area D Soils

Area A – Northeast Production and Bag Warehouse Areas

The eastern and northern portions of Area A are comprised of what formerly had been utilized for nitrate production plants, UAN and nitrate storage tanks, and ammonia nitrate processing. Investigation activities identified impacted soil and groundwater containing nitrate-nitrogen and ammonia-nitrogen on and beneath the nitrate production, warehousing, and UAN storage areas. This area of the Site is collectively referred to as the Northeast Production and Bag Warehouse Area.

Area D - UREA #2

The Urea #2 Area is located in the northwest portion of Area D and includes the Urea Production Area, Urea Plant, and the Urea Bulk Warehouse. Previous investigations have identified soil and groundwater containing nitrate-nitrogen and ammonia-nitrogen on and beneath the Urea Plant. Elevated concentrations of total nitrogen are higher in the subsurface soils near the central portion of the Urea Plant and in the vicinity of the urea vault.

The remedial alternative presented in the CAD for nitrogen impacts in surface and subsurface soils in both Area A and Area D is to maintain existing pavement in its current condition, and continue surface water runoff management activities in combination with Environmental Use Controls (EUCs). With this alternative, EUCs would be needed to ensure the following:

- prevent removal or disturbance of any existing pavement or impermeable surface unless building construction or new pavement is put in its place;
- require proper management/disposal of soils excavated for building purposes under the Soil and Waste Management Plan; and
- require repair of incidental damage or weathering of pavement.

Future development of the area would be subject to these restrictions.

4.7.6 Closure of Area B Ponds

Interim remedial measures have been performed in the Krehbiel Pond and West Pond as discussed above. Interim remedial measures have also been performed in the Overflow Pond, which were described in a Letter Report for Interim Measures Activities dated September 1, 2006. The remaining ponds in Area B have also exhibited concentrations of nitrate and ammonia that have not been previously addressed by interim remedial measures or closure activities.

These sediments and the upper portion of the native clay pond bases immediately underlying the sediments were identified as a primary source area of nitrogen compounds. Addressing these impacted materials is required by the CAD before closure of the ponds can be accomplished and to eliminate additional loading of nitrogen compounds leaching from the material to groundwater. Groundwater impacted by the infiltration of nitrogen compounds is currently addressed by the interceptor trench system. The remedial alternative presented in the CAD is removal of sediments from the West Extension, West Effluent, and East Effluent Pond; consolidation of these materials within the West Lime, Rundown, and East Lime Pond; and capping with an 18-inch soil cover and seeded with deep-rooted vegetation. In conjunction with these excavation activities, EUCs would be applied restricting subsurface excavation and limiting the type of construction on top of the ponds without the performance of a geotechnical analysis and, as necessary, material augmentation. On-site treatment of the impacted soil will be evaluated in the RD/RA.

Once it has been concluded that the Overflow Pond is no longer needed to contain impacted stormwater runoff for land application, the pond can be closed. Once the pond can be closed, the CAD indicates the pond area will be filled and graded similar to the West Lime, Rundown, and East Lime Ponds, including similar restrictions under appropriate EUCs.

Section 5 – Soil and Waste Management Plan

5.1 Introduction of Soil-Waste Management Plan

A Consent Order (CO) was signed between KDHE and the City of Lawrence on July 29, 2010, to address remaining environmental contamination at the Former Farmland Facility. As a component of the CO, the City agreed to record an Environmental Use Control Agreement (EUCA) in accordance with KDHE-approved Remedial Action Plan (RAP) (Shaw, 2009) and the Corrective Action Decision (CAD) (KDHE, 2010).

Environmental Use Controls (EUCs) consist of land use restrictions placed on the property to protect current and future public health and the environment. These restrictions are filed on the deed for the property and cannot be removed or modified without obtaining approval from KDHE. KDHE, working with the various future landowners, will provide oversight to ensure that the restrictions imposed by the EUCs are maintained at the Site in perpetuity.

The EUCs for the former Farmland facility will include:

- Notifications to KDHE prior to any intrusive activities being conducted on the property.
- Restrictions on drilling or using water wells for domestic or other purposes.
- Restrictions on Land Use (No residential uses).
- Restrictions on excavation, dredging, construction, or digging activities.
- Prohibition on all activities that would disturb or negatively impact erosional controls and vegetation along site drainages.
- Monitoring and maintenance of the vegetative covers and caps.
- Monitoring and maintenance of pavement and impervious surfaces on the restricted areas of the property.

The entire property will include EUCs to restrict land use (no residential uses), drilling water wells (for human consumption), and notification of intrusive activities. In addition to these global-property restrictions, other areas within the property will have area-specific restrictions. Please refer to **Figure 6-4** to determine specific restrictions per specific area.

A Soil-Waste Management Plan (SWMP) will be referenced in the EUCA and is a very important component of this Transition Plan. The purpose of this SWMP is to provide a simple, cost-effective soil and waste management program to protect human health and the environment during all future activities at the Site, including, but not limited to, demolition, Remedial Design/Remedial Action (RD/RA), redevelopment, and long-term operation of the former Farmland facility. The City of Lawrence and all future owners and developers of property located within the former Farmland facility (**Figure 1-1**) will be required to follow the restrictions outlined in the EUCA and this SWMP.

5.2 General Use of the SWMP

Previous environmental investigations completed at the former Farmland facility indicate soil, surface water and groundwater are impacted by fertilizer-related nitrogen compounds and ammonia in certain areas of the Site. In order to protect public health and the environment,

KDHE will require that impacted materials be properly managed and handled at all times during activities at the Site including, but not limited to:

- Demolition activities
- Redevelopment activities
- RD/RA activities
- Long-term operation and maintenance activities

Areas of the Site generally fall into two categories: 1) areas where soil was **not** impacted above the Non-Residential Risk-Based Standards for Kansas (RSK) values and 2) areas containing contaminants **above** the Non-Residential RSK values (Refer to current version of the Risk-Based Standards for Kansas Manual available on-line at: http://www.kdheks.gov/remedial/rsk_manual_page.htm.) These areas are shown on **Figures 6-1** through **6-4** (Shaw, 2009) and are further referenced in the RAP (Shaw, 2009). The data utilized to prepare these figures will be reviewed during the RD/RA process and may be further refined based on that review. These figures should be referred to when determining if a specific area has been impacted by environmental contamination.

This SWMP will assist future owners, operators, developers and others by providing a generalized outline of activities that must be implemented during all intrusive activities that occur at the Site. Any entity performing the intrusive activities described below, including but not limited to personnel from the City of Lawrence, environmental consultants, demolition and construction contractors, utility contractors, developers, future owners and others, will be required to strictly follow the notification and planning requirements outlined in this SWMP and the restrictions described in the EUCA.

In general, any intrusive activities conducted at the Site will require advanced notification to the KDHE and the City of Lawrence. In addition to notification, those areas containing contaminants **above** the Non-Residential RSK values will also require a specific Intrusive Activity Plan that includes a description of planning, notification, waste handling and disposal procedures and all associated documentation. Intrusive activities include any activities that disturb soil, concrete, asphalt, or other materials and may be the result of the following activities:

- Surveying
- Environmental drilling and sampling
- Utility repairs and new above and below ground utility installation
- Grading
- Paving
- Concrete or asphalt pad removal
- Foundation removal
- Construction activity that can disturb impacted surface or subsurface soils

(NOTE: This is not an all-inclusive list.)

Excavation refers to the removal or movement of soil. The following minor excavation activities that take place in areas **not** impacted above the non-residential RSK (see **Figure 6-4**) are not considered intrusive activities for the purposes of this Plan:

- Minor landscaping
- Utility repairs
- Sidewalk, concrete, or asphalt repair
- Fence post installation

These activities will be conducted so to minimize disturbance of vegetation and soil. Soil removed from an excavation will be stored within the immediate area of the excavation and will be backfilled into the excavation the same day. The disturbed surface area will be restored to its original condition.

6.1 Soil-Waste Management Plan Implementation

This section describes implementation of the Soil-Waste Management Plan (SWMP) for all activities including, but not limited to, dismantling, demolition, redevelopment, Remedial Design/Remedial Action, and long-term operation and maintenance activities currently planned for the Site. This outline describes the following procedures for management of soil, demolition materials, and waste during activities on the Site. Procedures are divided into three categories:

- 1) Intrusive activities/excavated soils (See **Section 6.2**)
- 2) Demolition debris and materials (See **Section 6.3**)
- 3) Waste materials and unknown materials (See **Section 6.4**)

6.2 Intrusive Activities/Excavated Soils

6.2.1 Intrusive Activity Notification and Intrusive Activity Plan

Prior to initiation of intrusive activities planned at the Site (See Section 5.2) the entity conducting the intrusive activity must notify the Project Managers for the KDHE Bureau of Environmental Remediation (BER) and City of Lawrence (Refer to Section 6.5 for contact information). Notification is required to prevent uncontrolled disturbance, potential human exposure to contaminants, and potential mobilization of soil contaminants. Written notification from the Project Managers will be required prior to conducting any intrusive activities at the Site.

The notification procedure to be followed at the Site is outlined below and illustrated in the flow chart titled **Figure 6-5**.

1. For any intrusive activity at the Site, the entity responsible for the intrusive activity must prepare an Intrusive Activity Notification that contains the following information:

- Description of the planned intrusive work (utility work, excavation, grading, etc.).
- Names, addresses and contact information for persons performing and responsible for the work.
- Location of the proposed intrusive activities including size and depth of the planned excavation or other intrusive activity as well as an estimated volume of material to be disturbed. GPS coordinates or survey coordinates shall be shown on a scale drawing.
- Scheduled starting date and schedule of planned activities.
- Evaluation of location in relationship to areas containing contaminants **above** the Non-Residential RSK values in **Figures 6-1** through **6-4**.
- Determination of whether a Notice of Intent (NOI) for Authorization to Discharge Stormwater Runoff from Construction Activities must be submitted to KDHE Bureau of Water (BOW). If the proposed activity is located in an area **not** impacted above the Non-Residential RSK values, then an NOI is required only if greater than 1 acre is disturbed. If located in an area containing contaminants **above** the Non-Residential RSK values, then an NOI is required regardless of the size of the area of soil disturbed. (Refer to

Section 6.5 for contact information). Note that the BOW requires the NOI be submitted at least 60 days in advance of commencing work.

2. If an intrusive activity is located in an area containing contaminants **above** the Non-Residential RSK values and specific EUCs apply, as indicated in **Figures 6-1** through **6-4**, the entity responsible for the intrusive activity must develop an Intrusive Activity Plan. The Intrusive Activity Plan should include the following information:

- Identification of utilities, buried piping, tanks, equipment to be removed/relocated or protected.
- Description of measures to be implemented for worker protection (not subject to KDHE approval or disapproval).
- Proposed plan regarding how soil or other materials will be staged, stored, and containerized (See **Section 6.2.3**).
- Plan for excavated soil, such as whether or not it will be returned to the excavation area. If not, provide details for re-location or disposal (See Section 6.2.4). Please note that soil may be re-located to the Northern Ponds in Area B in accordance with the RD/RA Plan.

3. The Intrusive Activity Notification and/or the Intrusive Activity Plan must be submitted at least ten working days prior to any planned intrusive activities. The notification and plan must be submitted to the City of Lawrence and KDHE BER as required by the EUCA for review and approval (Refer to Section 6.5 for contact information).

4. Written approval must be received from the City of Lawrence and KDHE BER before intrusive activities are initiated. Submissions will be evaluated by the City of Lawrence and KDHE BER in accordance with the EUCA and this SWMP.

5. Once written approval is obtained from both the City of Lawrence and KDHE BER, submit the Notice of Intent to KDHE BOW Stormwater Program (if applicable). Information and forms are available at www.kdheks.gov/stormwater. Note that KDHE BOW typically requires the NOI to be submitted 60 days prior to construction and may be submitted prior to the Intrusive Activity Plan to avoid delay.

6. After approval is issued by the BOW Stormwater Program, intrusive activity may be initiated following Best Management Practices (BMPs). The landowner/developer must obtain the construction general permit prior to initiating work and must develop and implement a Stormwater Pollution Prevention Plan as a condition of that permit.

6.2.2 Soil Characterization

Proper and adequate characterization of soils that are removed during intrusive activities will be required so that appropriate disposal decisions can be made. General requirements for characterizing soil from all areas of the Site include:

1. Soil from areas **not** impacted above Non-Residential RSK values may not require analysis for nitrate and ammonia unless there is visual evidence or odors that indicate possible impact. (Certain disposal options require analysis, see Section 6.2.4)

2. Soil from areas containing contaminants **above** the Non-Residential RSK values must be analyzed for nitrate and ammonia concentrations if the soil is not being returned to the excavation area or deposited in the Northern Ponds.
3. Additional analytical testing may be required, including a hazardous waste determination, if signs of visible contamination or odors are encountered during any intrusive activity. Work should stop immediately and KDHE BER, City of Lawrence notified within 24 hours. (Refer to Section 6.5 for contact information).

6.2.3 Management and Storage of Soil Waste

All soil, asphalt and other waste materials generated during activities at the Site will require appropriate management to avoid potentially mobilizing contaminants in these media and/or creating exposure.

- Soil stockpiles from areas containing contaminants **above** the Non-Residential RSK values (areas shown on **Figures 6-1** through **6-4**) will be placed on top of and covered with heavy duty plastic sheeting.
- Wherever possible, broken asphalt/concrete and excavated soil will be stockpiled in areas with an asphalt or concrete surface.
- Stockpile covering will be in good condition and securely anchored to minimize headspace where vapors may accumulate.
- When not covered, soil stockpile surfaces will be kept moist by water spray, as necessary to avoid visible dust emissions from the pile.
- Soil transport vehicles for off-site disposal will be covered with a tarp to minimize emissions to the atmosphere during transport.

6.2.4 Disposal of Soil Waste

The following steps apply to areas where soil is **not** impacted above the Non-Residential RSK values (areas shown on **Figures 6-1** through **6-4**) and does not appear to have been impacted:

1. Soil may be returned to the excavation area or re-located onsite without written approval from the KDHE BER or City of Lawrence.
2. Soil may be re-located to the Northern Ponds in Area B in accordance with the RD/RA Plan and approval of the City of Lawrence.
3. Soil may be used off-site if it meets the definition of clean rubble as defined in KSA 65-3402(w) (defined as uncontaminated soil) with written approval from KDHE BER. Approval will be based on previous investigations and may require analytical testing for ammonia and nitrate (KAR 28-29-501).
4. Soil may be disposed in a KDHE-permitted facility with approval from the KDHE Bureau of Waste Management (BWM) (Refer to Section 6.5 for contact information).

5. If soil will be relocated off-site to a location that is not a KDHE-permitted disposal facility, disposal options will be evaluated based on analytical results and other data generated during activities. Written approval from KDHE BER and City of Lawrence is required.

The following steps apply to areas containing contaminants **above** the Non-Residential RSK values (areas shown on **Figures 6-1** through **6-4**) or where there is visual evidence or odors that indicate that soils may be impacted:

1. If soil is determined to not classify as a hazardous waste (See Section 6.2.2), the soil may be returned to the area of excavation or re-located to the Northern Ponds in Area B (in accordance with the RD/RA Plan and with approval of the City of Lawrence) as described in the Intrusive Activity Plan.
2. If soil is determined to not classify as a hazardous waste (See Section 6.2.2) and is planned for disposal at a municipal solid waste landfill, it is classified as a special waste, which requires approval from the KDHE Bureau of Waste Management (BWM) before disposal (Refer to **Section 6.5** for contact information).
3. If soil is determined to classify as a hazardous waste, the soil must be sent to a RCRA Subtitle C permitted facility.
4. If soil will be either disposed or relocated on-site or off-site in a manner different than stated above, written approval must be received prior to relocation or disposal from the City of Lawrence and KDHE BER.

6.3 Demolition Debris and Materials

Demolition waste is defined by KSA 65-3402(u) and must be disposed at a permitted solid waste facility. The notification procedure for demolition activities is outlined below and illustrated in the flow chart titled **Figure 6-6**.

- Notification of demolition of structures must be submitted to KDHE at least ten working days prior to the start of demolition. This demolition form (ET-ASB10) is available at the KDHE website at www.kdheks.gov/asbestos/download/demonot.pdf. The completed form must be submitted to KDHE Bureau of Environmental Health (BEH) and a copy to KDHE BER (Refer to Section 6.5 for contact information).
- If friable asbestos-containing materials (ACM) are found in structures, then the asbestos notification form (ET-ASB8) must be completed and submitted to KDHE BEH following at least ten working days prior to abatement activities. Friable ACM must be disposed at a Subtitle D landfill under a special waste authorization. Non-friable ACM may be disposed in a permitted construction-demolition landfill.
- If waste material is not being disposed in a state-permitted landfill, approval must be obtained from KDHE Northeast District Office (NEDO) and the City of Lawrence prior to disposal (Refer to Section 6.5 for contact information).
- A haul route for disposal of materials prior to transporting material off-site must be approved by the City of Lawrence and transported in accordance with local, state, and federal regulations.

6.4 Waste Materials and Unknown Materials

The purpose of this section is to describe the procedures required for managing waste materials generated or discovered during activities at the Site. Known and/or unknown waste materials encountered during intrusive activities must be handled in an appropriate manner that is protective of human health and the environment. The appropriate steps that must be followed are outlined below and illustrated in the flow chart titled **Figure 6-7**.

1. If unknown materials are observed during an intrusive activity, stop work and notify the City of Lawrence, KDHE BER, and KDHE NEDO within 24 hours of discovery (Refer to Section 6.5 for contact information). Special handling, management, analytical testing, and disposal requirements may apply and further investigation may be necessary. The notification must include:
 - Description of the unknown materials
 - Location
 - Estimated quantity

2. Identify solid wastes generated (defined in 40 Code of Federal Regulations (CFR) Part 261.2 and in KSA 65-3402) and hazardous wastes (defined in 40 CFR Part 261.3). Potential waste streams that may be generated at the Site may include but are not limited to the following:
 - Construction and demolition waste
 - Excavated concrete/asphalt pads and foundations
 - Oil and other liquids from pumps, compressors, pipes, and other equipment
 - Potential mercury-containing equipment
 - Excavated soil (Impacted soil is most likely only impacted with nitrates and/or ammonia but other materials such as petroleum, oils and lubricants, and metals may be present in some areas.)
 - Potential asbestos-containing materials
 - Potential PCB-containing materials from transformers or other equipment
 - Investigation-derived waste from intrusive sampling activities

3. Conduct a waste determination for waste streams generated at the Site at the time accumulation begins based upon generator knowledge, historical investigation data and/or current sampling and analysis (preferred method) in accordance with 40 CFR 260, Appendix I and 40 CFR 262.11.

4. If waste material is not disposed at a RCRA Subtitle C facility as a hazardous waste, a KDHE-permitted landfill as a non-hazardous waste, or sent to a recycling facility, written approval must be obtained from KDHE NEDO and the City of Lawrence.. Waste that

classifies as a “special waste” being disposed in a municipal solid waste landfill requires approval from KDHE BWM.

5. Copies of all supporting disposal documentation (including landfill receipts, hazardous waste manifests, and land disposal restriction notices, bills of lading, and certificates of destruction for any hazardous waste) must be provided to the City of Lawrence (Refer to Section 6.5 for contact information).

6.5 Contact Information

As referenced throughout the SWMP (Section 6) notifications, plans, forms and other noted documents must be submitted to a variety of individuals for acknowledgment and/or approval. The names of these contacts may change over time; however, the position title will remain the same. This contact information section will be updated periodically when individual names have changed. Various notifications described in this SWMP should be submitted to:

PLEASE NOTE THAT MOST NOTIFICATIONS WILL REQUIRE NOTIFYING TWO OR MORE CONTACTS.

CONTACT:

Matt Bond, P.E., CFM
Stormwater Engineer
City of Lawrence
Public Works Department
Lawrence, Kansas 66044
Phone: 785-832-3142
Email: mbond@ci.lawrence.ks.us

Pamela Green, Project Manager
Bureau of Environmental Remediation
KDHE
1000 SW Jackson, Suite 410
Topeka, KS 66613
Phone: 785-296-1935
Email: pgreen@kdks.gov

Julie Coleman
District Environmental Administrator
Northeast District Office, KDHE
800 West 24th St.
Lawrence, KS 66046
Phone: 785-842-4600
Email: jcoleman@kdheks.gov

Scott Bangert, Unit Manager
Bureau of Environmental Health
KDHE
1000 SW Jackson, Suite 330

FOR THE FOLLOWING NOTIFICATIONS:

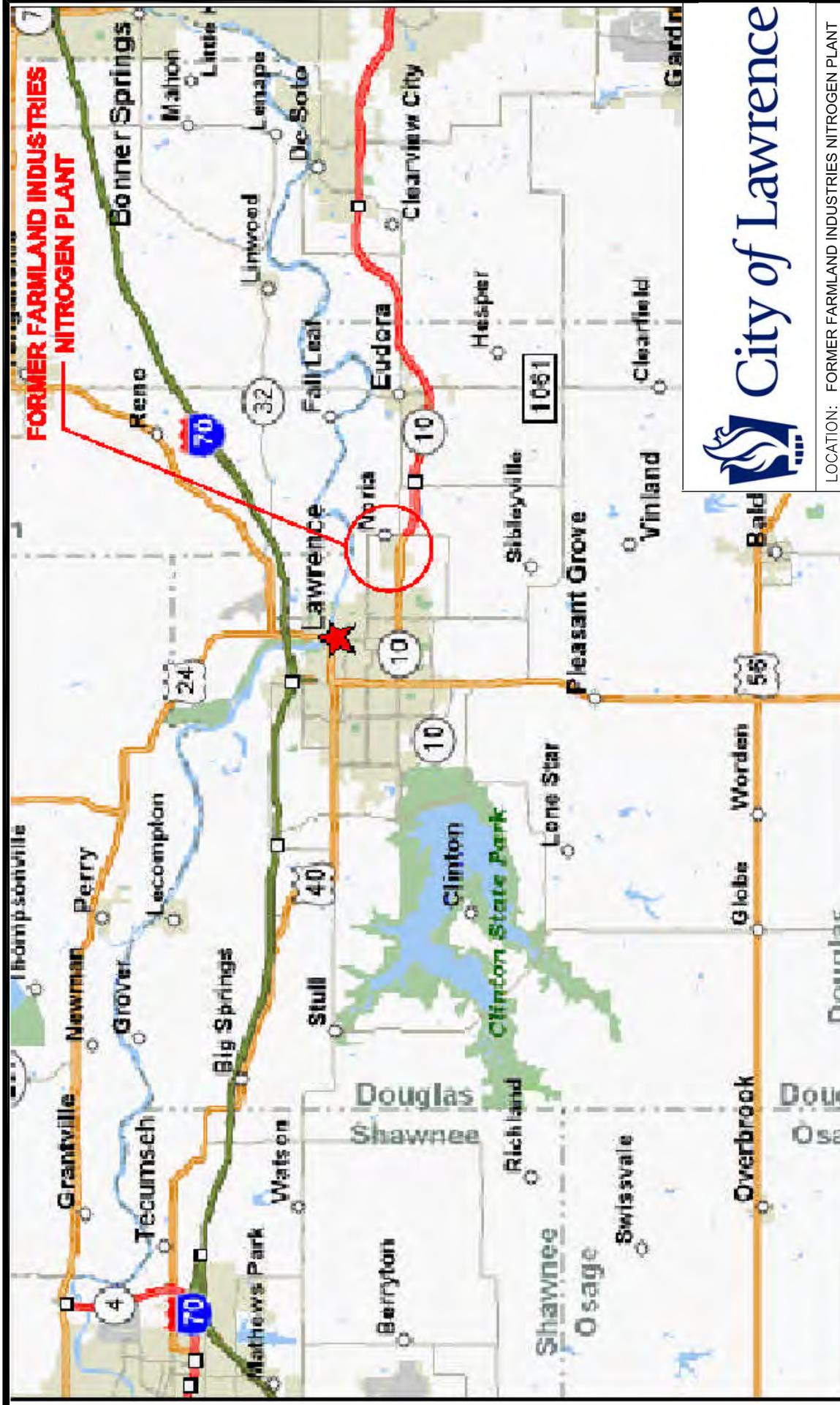
Intrusive Activity Notification
Intrusive Activity Plan
Unknown Waste Discovery & Determinations
Soil Relocation & Disposal Activities
Disposal of Excavated Soil in Northern Ponds
Demolition Activities

Intrusive Activity Notification
Intrusive Activity Plan
Demolition Activities Notification
Soil Relocation & Disposal Activities
Unknown Waste Discovery & Determinations

Construction & Demolition Debris not
disposed in a state-permitted landfill
Unknown Waste Discovery & Determinations

Demolition Activities Notification
Asbestos Abatement Notification

- Farmland, 1986. Sampling and Analysis Plan for the CRS Unit. Farmland Industries Nitrogen Plant. November.
- KDHE, 2010. Final Corrective Action Decision for the Former Farmland Industries Nitrogen Plant Site. Prepared by Kansas Department of Health and Environmental, Bureau of Environmental Remediation. February.
- Shaw, 2005. Land Application Plan for Nitrate-impacted Water. Former Farmland Industries Nitrogen Plant, Prepared for Farmland Industries Remediation Trust. March.
- Shaw, 2009. Remedial Action Plan. Former Farmland Industries Nitrogen Plant, Prepared for the Farmland Industries Remediation Trust. May.

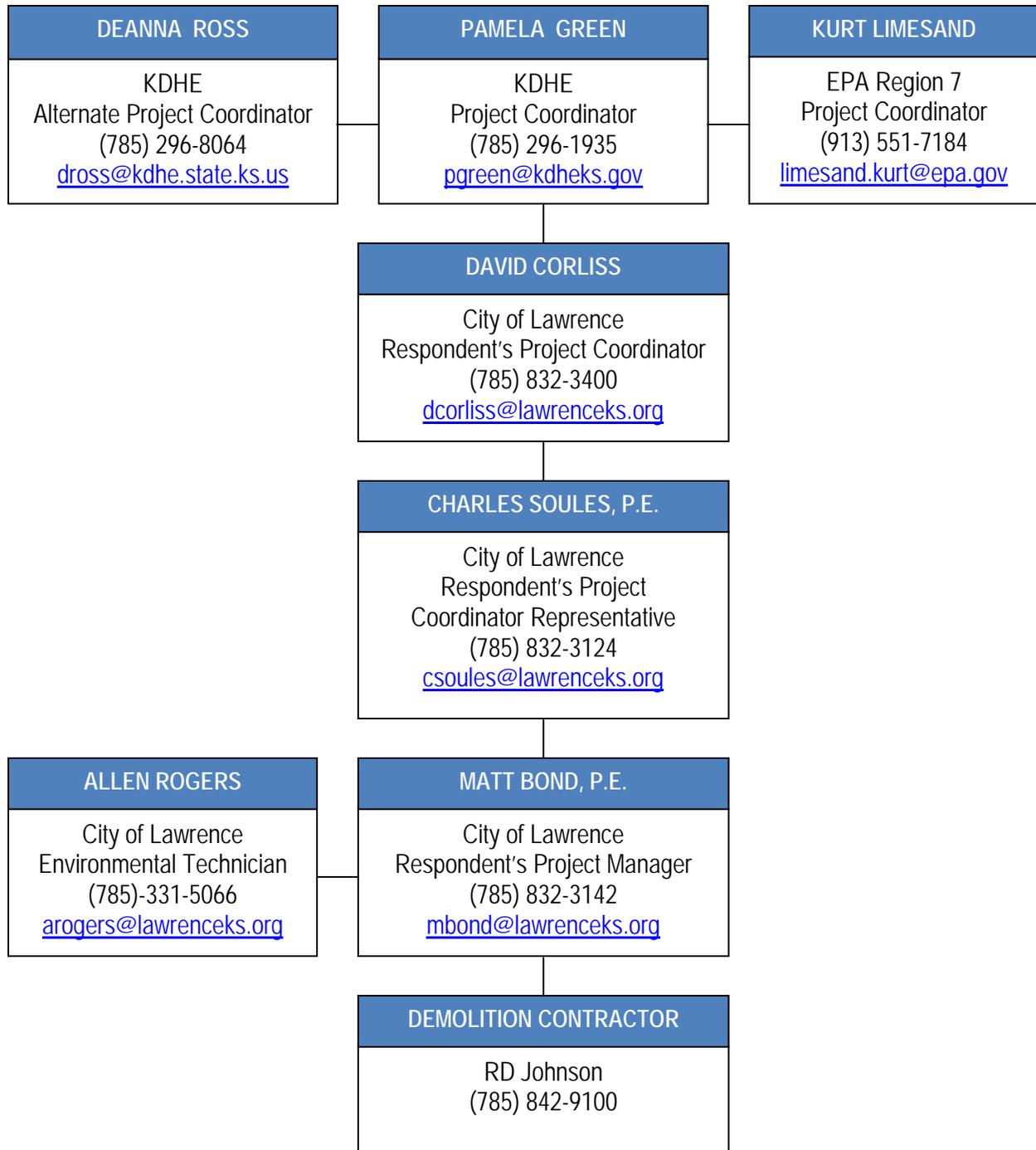


LOCATION: FORMER FARMLAND INDUSTRIES NITROGEN PLANT

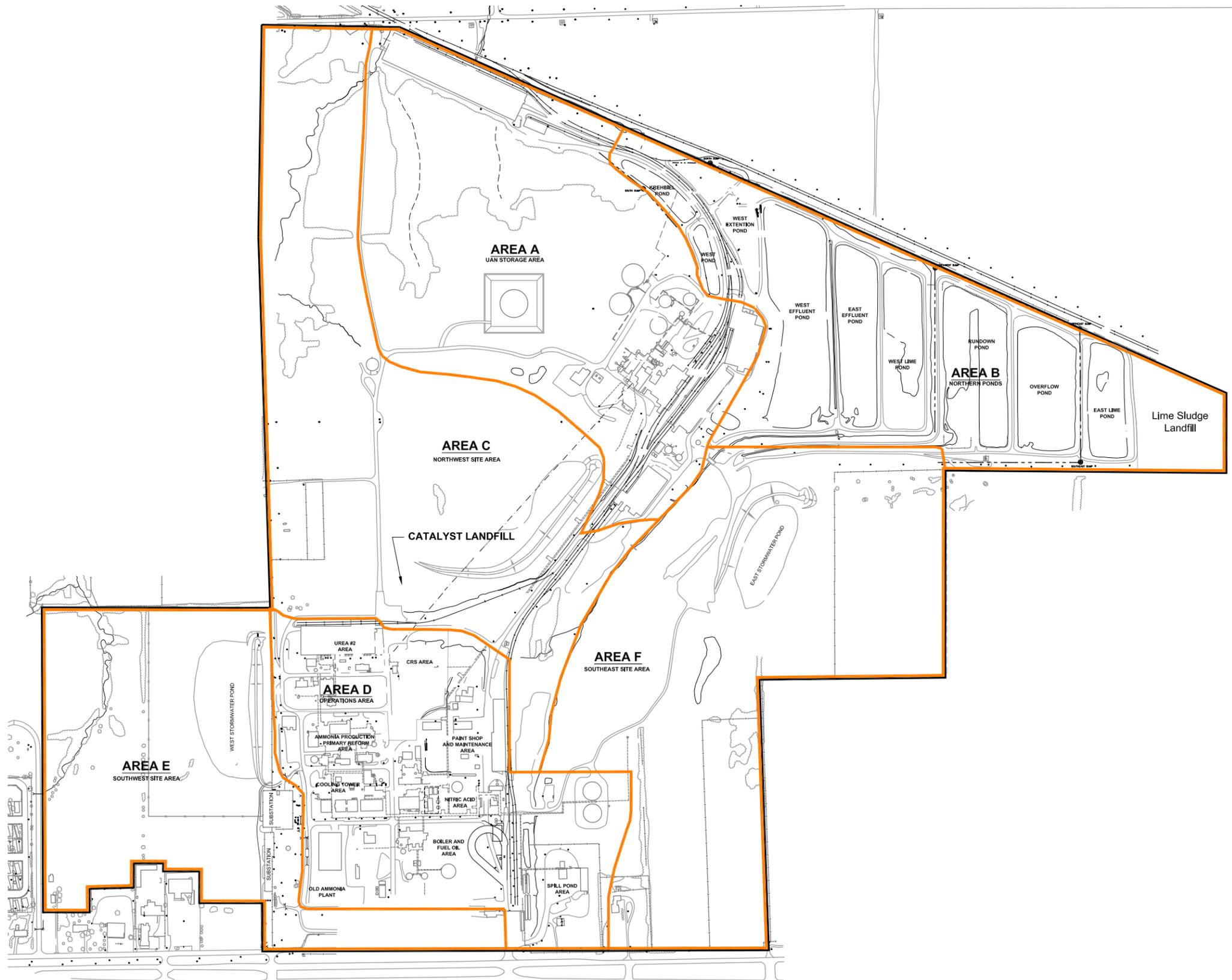
TITLE: SITE LOCATION MAP

DRAWN BY CTD	CHECKED BY LAT	APPROVED BY LBV
PROJECT NO. 16530684	DATE OCT 2010	DRAWING NO. 1-1

**Figure 3-1
Project Organization Chart
Former Farmland Industries Nitrogen Plant
Lawrence, Kansas**

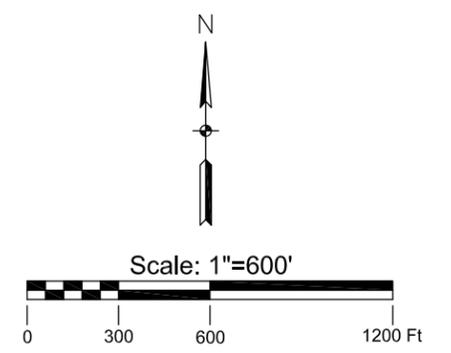


October 28, 2010 7:28:06 am (cro)
 J:\Farmland Nitrogen Plant\CAD\Plan Sheets\Fig 4-1_Remedial Management Areas.dwg



LEGEND

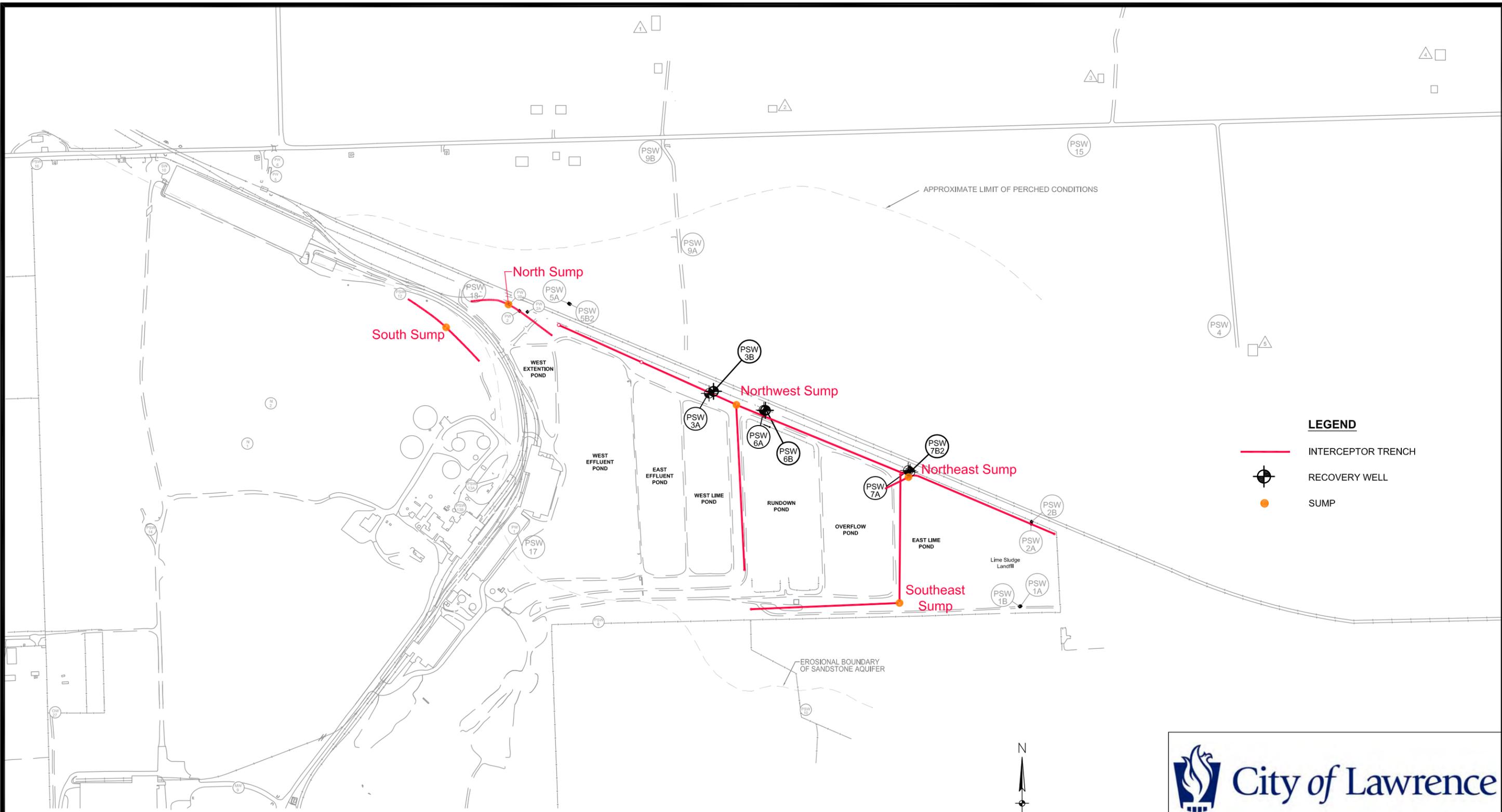
-  AREA BOUNDARY
-  FORMER PLANT BOUNDARY



 City of Lawrence		
LOCATION: FORMER FARMLAND INDUSTRIES NITROGEN PLANT		
TITLE: REMEDIAL MANAGEMENT AREAS		
DRAWN BY CTD	CHECKED BY LAT	APPROVED BY LBV
PROJECT NO. 16530684	DATE OCT. 2010	FIGURE NO. 4-1

SOURCE: SHAW ENVIRONMENTAL, 2009

October 28, 2010 7:30:48 am (cro)
 J:\Farmland Nitrogen Plant\CAD\Plan Sheets\Fig 4-2_Interceptor Trench.dwg



LEGEND

- INTERCEPTOR TRENCH
- RECOVERY WELL
- SUMP

N

Scale: 1" = 500'



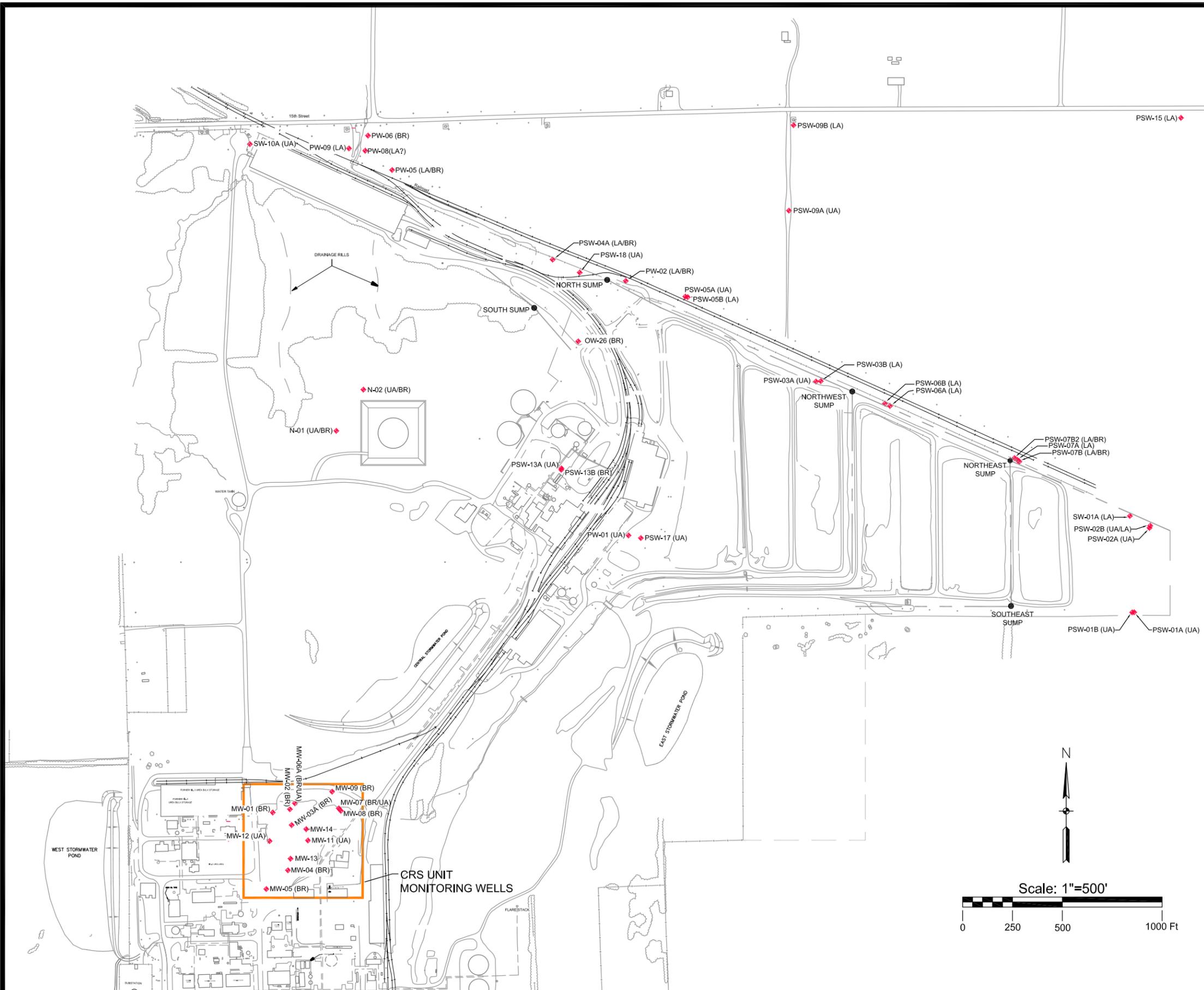
LOCATION: FORMER FARMLAND INDUSTRIES NITROGEN PLANT

TITLE: **INTERCEPTOR TRENCH AND RECOVERY WELL LOCATIONS**

DRAWN BY CTD	CHECKED BY LAT	APPROVED BY LBV
PROJECT NO. 16530684	DATE OCT. 2010	FIGURE NO. 4-2

SOURCE: SHAW ENVIRONMENTAL, 2009

October 28, 2010 7:51:46 am (cra)
 J:\Farmland Nitrogen Plant\CAD\Plan Sheets\Fig 4-4_Monitoring Wells.dwg

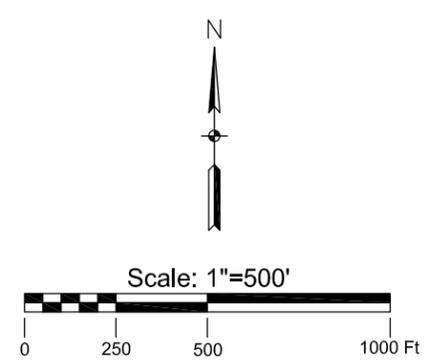


PSW-04 (LA) ◆
 KITSMILLER ◆

LEGEND

◆ ACTIVE MONITORING WELL / PUMPING WELL

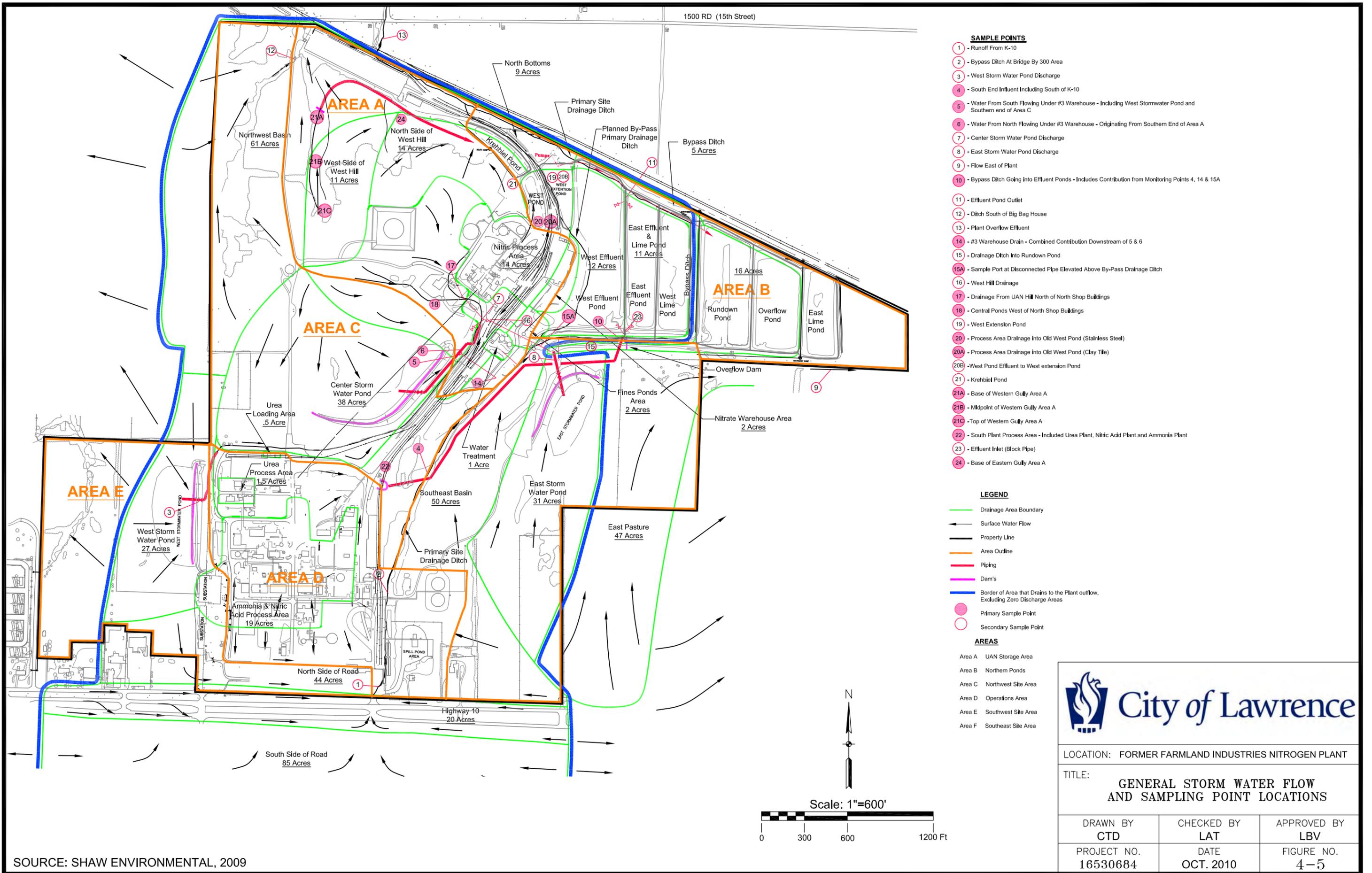
UA = SILTY CLAY UNIT OR OVERBURDEN UNIT
 LA = LOWER AQUIFER (ALLUVIAL AQUIFER)
 BR = BEDROCK UNIT
 UK = UNKNOWN COMPLETION DATA



SOURCE: SHAW ENVIRONMENTAL, 2009



LOCATION: FORMER FARMLAND INDUSTRIES NITROGEN PLANT		
TITLE: MONITORING WELL LOCATION MAP		
DRAWN BY CTD	CHECKED BY LAT	APPROVED BY LBV
PROJECT NO. 16530684	DATE OCT. 2010	FIGURE NO. 4-4



SOURCE: SHAW ENVIRONMENTAL, 2009

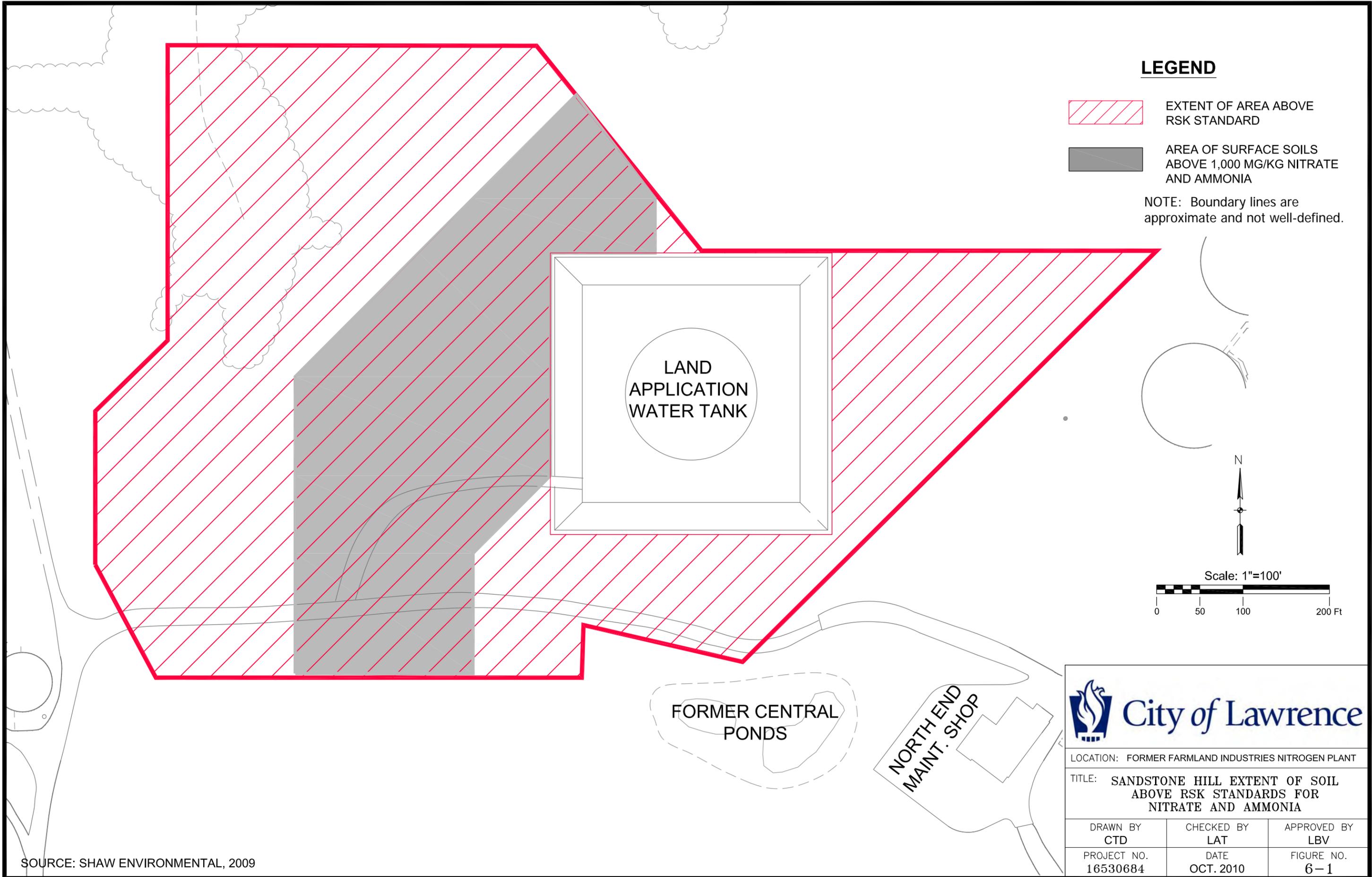


LOCATION: FORMER FARMLAND INDUSTRIES NITROGEN PLANT

TITLE: GENERAL STORM WATER FLOW AND SAMPLING POINT LOCATIONS

DRAWN BY CTD	CHECKED BY LAT	APPROVED BY LBV
PROJECT NO. 16530684	DATE OCT. 2010	FIGURE NO. 4-5

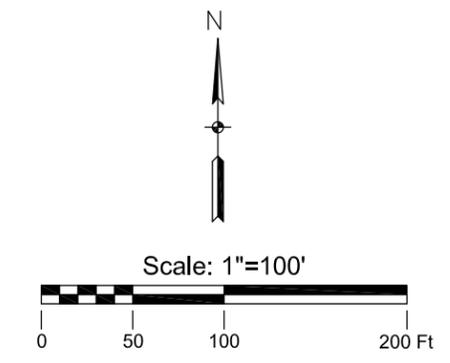
October 28, 2010 8:02:28 am (cra)
j:\Farmland Nitrogen Plant\CAD\Plan Sheets\FIG 6-1, 6-2.dwg



LEGEND

-  EXTENT OF AREA ABOVE RSK STANDARD
-  AREA OF SURFACE SOILS ABOVE 1,000 MG/KG NITRATE AND AMMONIA

NOTE: Boundary lines are approximate and not well-defined.



LAND
APPLICATION
WATER TANK

FORMER CENTRAL
PONDS

NORTH END
MAINT. SHOP



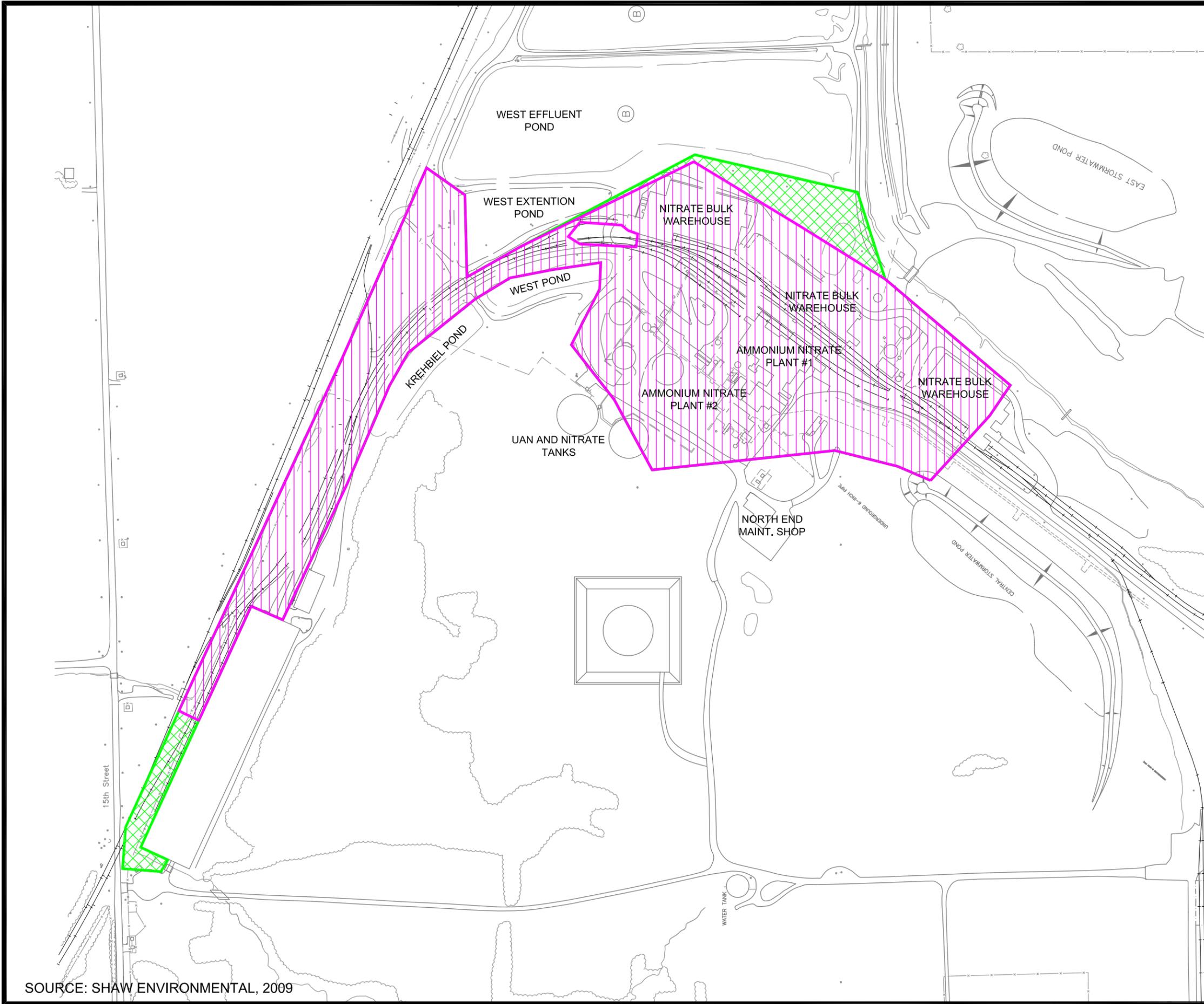
LOCATION: FORMER FARMLAND INDUSTRIES NITROGEN PLANT

TITLE: SANDSTONE HILL EXTENT OF SOIL ABOVE RSK STANDARDS FOR NITRATE AND AMMONIA

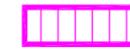
DRAWN BY CTD	CHECKED BY LAT	APPROVED BY LBV
PROJECT NO. 16530684	DATE OCT. 2010	FIGURE NO. 6-1

SOURCE: SHAW ENVIRONMENTAL, 2009

October 28, 2010 8:01:46 am (cra)
 J:\Farmland Nitrogen Plant\CAD\Plan Sheets\FIG 6-1, 6-2.dwg



LEGEND



EXTENT OF SURFACE SOILS ABOVE RSK STANDARDS

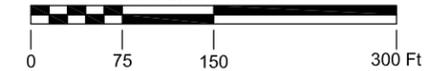


EXTENT OF SUBSURFACE SOILS ABOVE RSK STANDARDS

NOTE: Boundary lines are approximate and not well defined.



Scale: 1"=300'



City of Lawrence

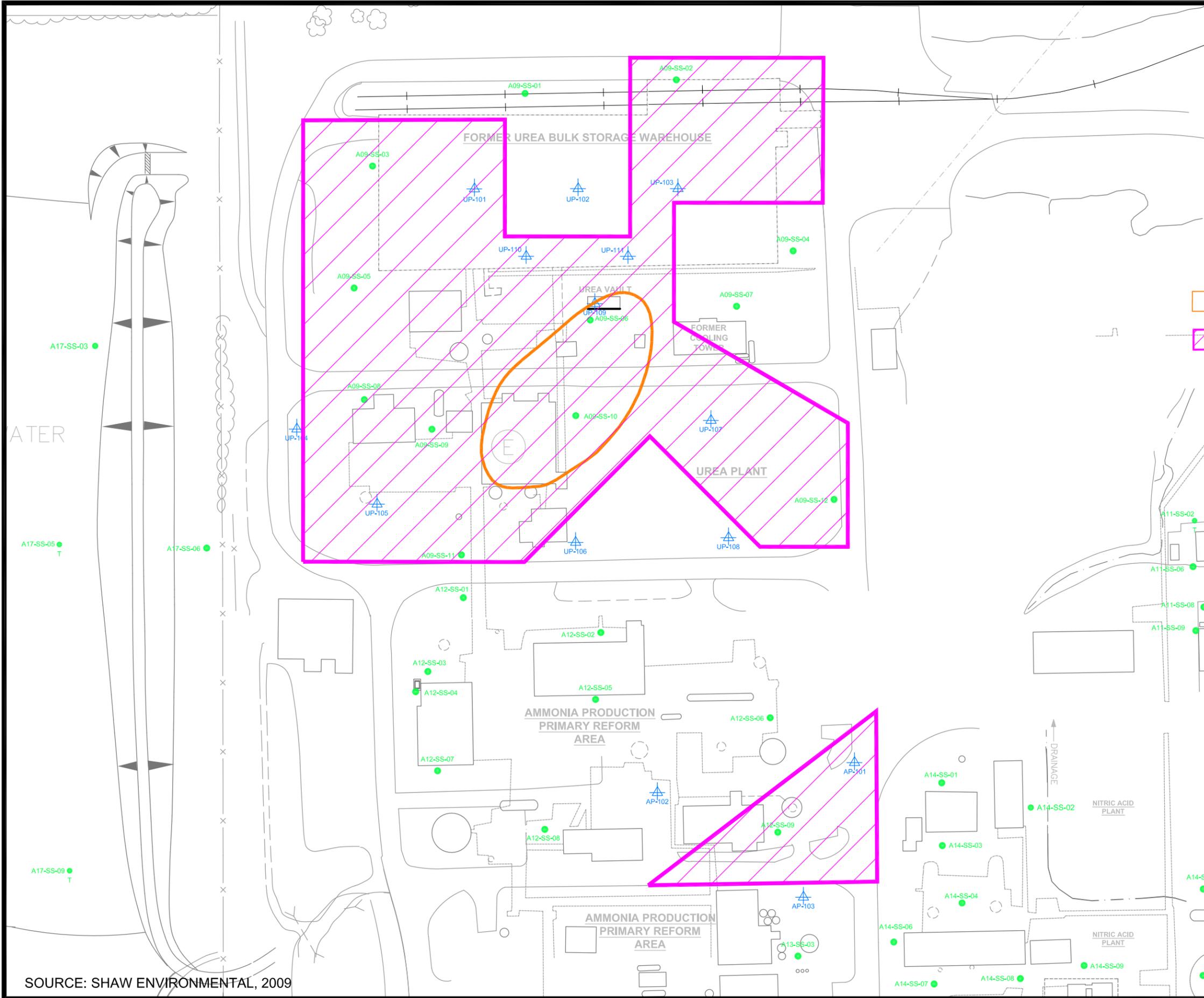
LOCATION: FORMER FARMLAND INDUSTRIES NITROGEN PLANT

TITLE: SANDSTONE HILL EXTENT OF SOIL ABOVE RSK STANDARDS FOR NITRATE AND AMMONIA

DRAWN BY CTD	CHECKED BY LAT	APPROVED BY LBV
PROJECT NO. 16530684	DATE OCT. 2010	FIGURE NO. 6-2

SOURCE: SHAW ENVIRONMENTAL, 2009

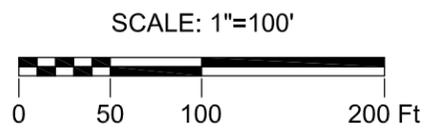
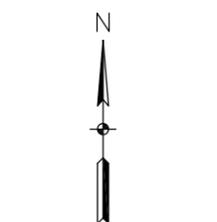
October 28, 2010 8:03:44 am (cra)
 J:\Farmland Nitrogen Plant\CAD\Plan Sheets\Figure 6-3.dwg



LEGEND

- SOIL BORING (2005 INVESTIGATION)
- ▲ SOIL BORING (2007 INVESTIGATION)
- ORIGINAL LANDFILL FOOT PRINT
- EXTENT OF SURFACE AND SUBSURFACE SOILS ABOVE RSK STANDARDS

NOTE: Boundary lines are approximate and not well-defined.



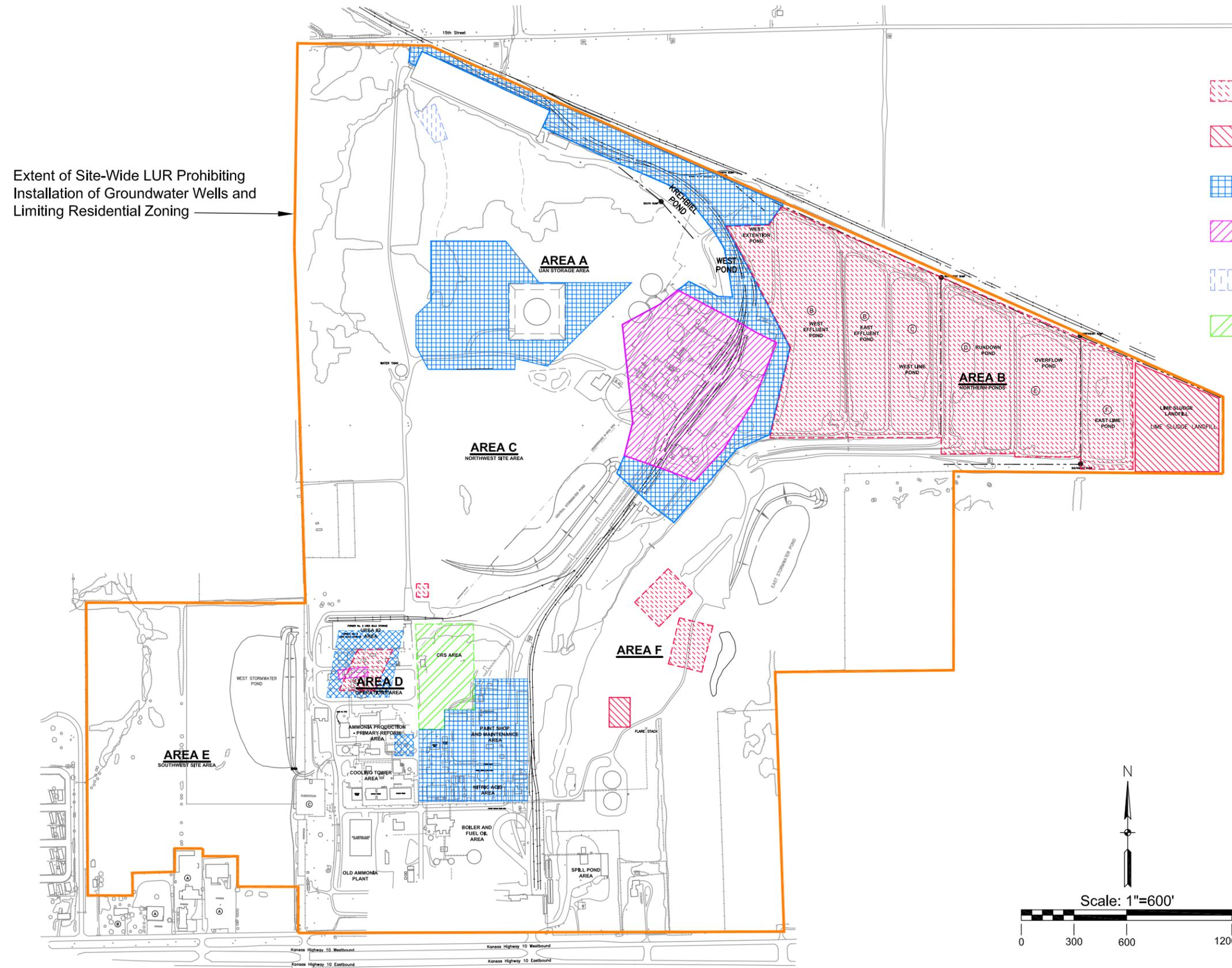
LOCATION: FORMER FARMLAND INDUSTRIES NITROGEN PLANT

TITLE: AREA D SOILS ABOVE RSK STANDARDS FOR NITRATE AND AMMONIA
 NITRATE AND AMMONIA

DRAWN BY CTD	CHECKED BY LAT	APPROVED BY LBV
PROJECT NO. 16530684	DATE OCT. 2010	FIGURE NO. 6-3

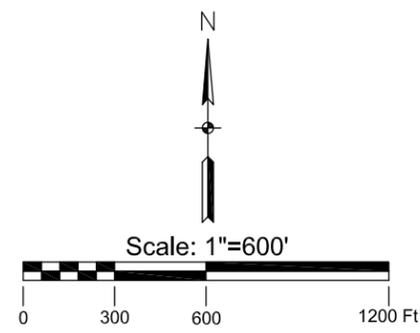
SOURCE: SHAW ENVIRONMENTAL, 2009

October 28, 2010 8:04:33 am (era)
 J:\Farmland Nitrogen Plant\CAD\Plan Sheets\Figure 6-4_Summary of LURs.dwg



- LEGEND**
- Excavation Restricted (Planned)
 - Excavation Restricted (Existing Covenant)
 - LUR - Soil Management Required if Excavated (Planned)
 - Preservation of Existing Ground Cover - Soil Management Required if Excavated (Planned)
 - Preservation and Maintenance of Existing Control Structure (Planned)
 - Deed Notice - Pending RCRA Closure (Existing)

NOTE: Boundary lines are approximate and not well-defined.



LOCATION: FORMER FARMLAND INDUSTRIES NITROGEN PLANT

TITLE: **SUMMARY OF LURS AND ADMINISTRATIVE CONTROLS**

DRAWN BY CTD	CHECKED BY LAT	APPROVED BY LBV
PROJECT NO. 16530684	DATE OCT. 2010	FIGURE NO. 6-4

SOURCE: SHAW ENVIRONMENTAL, 2009

**FIGURE 6-5
INTRUSIVE ACTIVITY PROCEDURE**

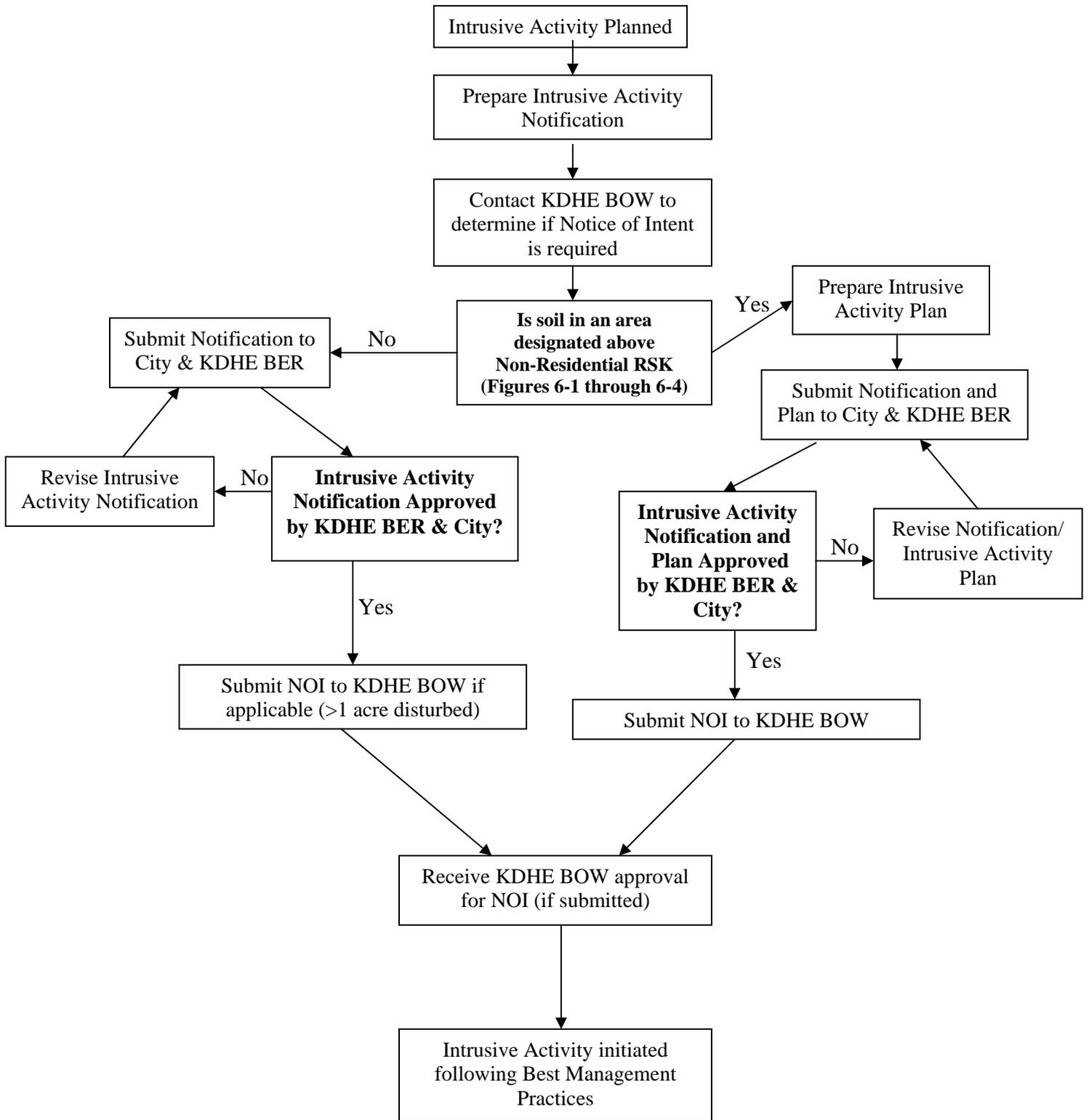


FIGURE 6-6
Procedure for Soil Generated from Intrusive Activities
Former Farmland Industries Site

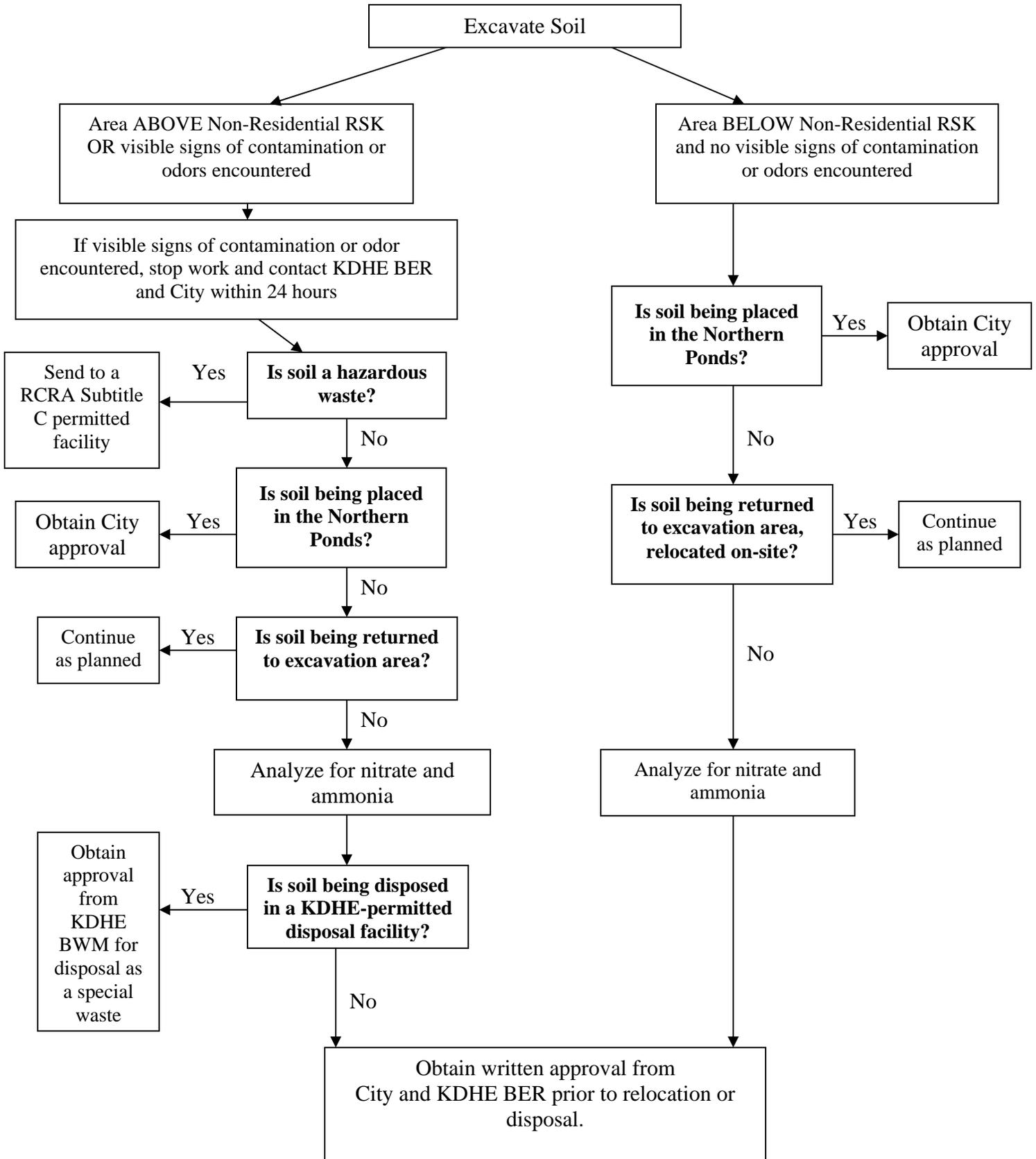


FIGURE 6-7
Procedure for Demolition Debris/Materials
Former Farmland Industries Site

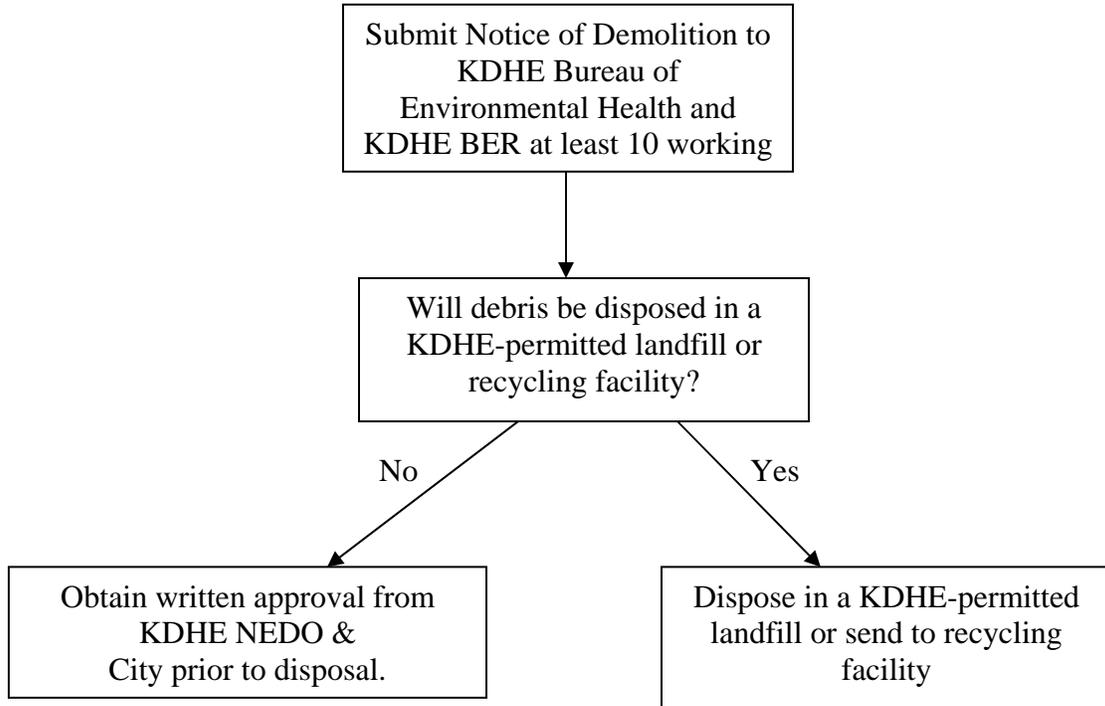


FIGURE 6-8
Procedure for Discovery/Generation of Waste
Former Farmland Industries Site

