

Updated: 9/24/12 @ 11:30am Added communications for the following items: Item 1 - CUP for Penny Sand Pit at N 1500 Rd & E 1850 Rd Item 2 - Rezoning 1674 N 1000 Rd Misc Item 1 - Text Amendment Initiation

9/21/12 @ 5:00pm Added staff memo, revised staff report, & communications for: Item 1 - CUP for Penny Sand Pit at N 1500 Rd & E 1850 Added communications for Item 4E - Preliminary Plat for Former Farmland Industries

9/19/12 @ 4:45pm

The Wednesday, September 26th Planning Commission meeting has been cancelled

LAWRENCE-DOUGLAS COUNTY METROPOLITAN PLANNING COMMISSION CITY HALL, 6 EAST 6TH STREET, CITY COMMISSION MEETING ROOM AGENDA FOR PUBLIC & NON-PUBLIC HEARING ITEMS SEPTEMBER 24 & 26, 2012 6:30 - 10:30 PM

GENERAL BUSINESS:

PLANNING COMMISSION MINUTES

Receive and amend or approve the minutes from the Planning Commission meeting of August 20, 2012.

COMMITTEE REPORTS

Receive reports from any committees that met over the past month.

COMMUNICATIONS

- a) Receive written communications from the public.
- b) Receive written communications from staff, Planning Commissioners, or other commissioners.
- c) Receive written action of any waiver requests/determinations made by the City Engineer.
- d) Disclosure of ex parte communications.
- e) Declaration of abstentions from specific agenda items by commissioners.

AGENDA ITEMS MAY BE TAKEN OUT OF ORDER AT THE COMMISSION'S DISCRETION

REGULAR AGENDA (SEPTEMBER 24, 2012) MEETING PUBLIC HEARING ITEMS:

ITEM NO. 1 CONDITIONAL USE PERMIT FOR PENNY SAND PIT; N 1500 RD & E 1850 RD (MKM)

CUP-12-00099: Consider a Conditional Use Permit for sand excavation and extraction for Penny Sand Pit, approximately 434 acres located on the NE Corner of N 1500 Road & E 1850 Road. Submitted by Landplan Engineering, for William Penny & Van LLC, property owners of record. *Joint meeting with Eudora Planning Commission.*

ITEM NO. 2 A TO R-T; 31 ACRES; 1674 N 1000 RD (MKM)

Z-12-00098: Consider a request to rezone approximately 31 acres from County A (Agriculture) to County R-T (Rural-Tourism Business), located at 1674 N 1000 Rd. Submitted by Mid-American Association for Autistic Training and Research (MAATR), for Marcus and Sandra Patton, property owners of record.

ITEM NO. 3 VARIANCE FOR GRAND ADDITION NO. 2; 3400 & 3401 ALDRICH ST (SLD)

MS-12-00092: Consider a variance associated with the Minor Subdivision for Grand Addition No. 2, from the 150' right-of-way requirements in section 20-810 (e)(5) for an arterial street, Kasold Drive, to remain at 100', and from section 20-811 (c) to require a sidewalk on the south side of Aldrich Street. A four-lot division located at 3400 and 3401 Aldrich Street. Submitted by Dean Grob for Jerry Willis, Grand, LLC, property owners of record.

ITEM NO. 4A I-4 & VC TO UR-FP; 31.7 ACRES; N OF K-10 BETWEEN GREENWAY CIR & E 1575 RD (SMS)

Z-12-00119: Consider a request to rezone approximately 31.7 acres (and adjacent railroad r-o-w) from I-4 (Heavy Industrial) and VC (Valley Channel) Districts to UR-FP (Urban Reserve – Floodplain Overlay) District, located in the NE1/4 & NW1/4 Sec 4-13-20 (Former Farmland Industries property, N of K-10 between Greenway Circle & E 1575 Rd). *Initiated by City Commission on 8/7/12.*

ITEM NO. 4B I-4 TO UR; 170.4 ACRES; N OF K-10 BETWEEN GREENWAY CIR & E 1575 RD (SMS)

Z-12-00120: Consider a request to rezone approximately 170.4 acres (and adjacent railroad r-o-w) from I-4 (Heavy Industrial) District to UR (Urban Reserve) District, located in the NE1/4 & NW1/4 Sec 4-13-20 (Former Farmland Industries property, N of K-10 between Greenway Circle & E 1575 Rd). *Initiated by City Commission on 8/7/12.*

ITEM NO. 4C I-4, I-1, A, & CC200 TO IG; 170.7 ACRES; N OF K-10 BETWEEN GREENWAY CIR & E 1575 RD (SMS)

Z-12-00121: Consider a request to rezone approximately 170.7 acres (and adjacent highway r-o-w) from I-4 (Heavy Industrial), I-1 (Limited Industrial), A (Agricultural) County Districts and CC200 (Community Commercial Center) City District to IG (General Industrial) District, located in the NW1/4 & SW1/4 Sec 4-13-20 (Former Farmland Industries property, N of K-10 between Greenway Circle & E 1575 Rd). *Initiated by City Commission on 8/7/12.*

ITEM NO. 4D I-1, B-1, A, & IG TO IM; 59 ACRES; N OF K-10 BETWEEN GREENWAY CIR & E 1575 RD (SMS)

Z-12-00122: Consider a request to rezone approximately 59.0 acres (and adjacent highway r-o-w) from I-1 (Limited Industrial), B-1 (Neighborhood Business); A (Agricultural) [County Districts] and IG (General Industrial) District to IM (Medium Industrial) District, located in the SE1/4 Sec 5-13-20 &

SW1/4 Sec 4-13-20 (Former Farmland Industries property, N of K-10 between Greenway Circle & E 1575 Rd). *Initiated by City Commission on 8/7/12.*

NON-PUBLIC HEARING ITEM:

ITEM NO. 4E PRELIMINARY PLAT FOR FORMER FARMLAND INDUSTRIES; N OF K-10 BETWEEN GREENWAY CIR & E 1575 RD (SMS)

PP-12-00101: Consider a Preliminary Plat for the Former Farmland Industries property, an industrial subdivision containing 20 lots, 4 tracts and 4 greenway tracts. The property is located N of K-10 between Greenway Circle & E 1575 Rd. Submitted by Bartlett & West, for City of Lawrence, property owner of record.

RESUME PUBLIC HEARING:

ITEM NO. 4F SPECIAL USE PERMIT FOR WESTAR SUBSTATION; N OF K-10 BETWEEN GREENWAY CIR & E 1575 RD (SMS)

SUP-12-00100: Consider a Special Use Permit for a Westar substation to provide electricity to the Former Farmland Industries property and surrounding properties. The property is located N of K-10 between Greenway Circle & E 1575 Rd. Submitted by Bartlett & West for Westar Energy. The City of Lawrence is the property owner of record.

MISCELLANEOUS NEW OR OLD BUSINESS

MISC NO. 1 TEXT AMENDMENT INITIATION

Information Item: The City Commission, at their August 21, 2012 meeting, initiated the text amendments noted in the attached memo. Staff will work to draft the code language and place each amendment on a future Planning Commission agenda.

Consideration of any other business to come before the Commission.

ADJOURN

CALENDAR

August 2012				012		
Sun	Mon	Tue	Wed	Thu	Fri	Sat
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5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

September 2012						
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30						

October 2012						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

PCCM Meeting:

(Generally 2nd Wednesday of each month, 7:30am-9:00am)

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PLANNING COMMISSION MEETING August 20, 2012 Meeting Minutes DRAFT

August 20, 2012 – 6:30 p.m.

Commissioners present: Belt, Blaser, Britton, Culver, Hird, Lamer, Liese, von Achen Staff present: McCullough, Stogsdill, Day, Larkin, Leininger, M. Miller, Stoddard, Ewert

MINUTES

Receive and amend or approve the minutes from the Planning Commission meeting of July 23, 2012.

Motioned by Commissioner Hird, seconded by Commissioner Culver, to approve the July 23, 2012 Planning Commission minutes.

Motion carried 7-0-1 with Commissioner Belt abstaining.

COMMITTEE REPORTS

Receive reports from any committees that met over the past month.

Commissioner Blaser said the Metropolitan Planning Organization (MPO) met last week and reviewed the Transportation Improvement Program (TIP). He said the funding for Cottonwood Inc, Bert Nash, Douglas County Senior Services, and Independence Inc were added for transportation. He also stated volunteers were needed for the annual bicycle/pedestrian count in September.

EX PARTE / ABSTENTIONS / DEFERRAL REQUEST

- No ex parte.
- Abstentions:

Commissioners Britton and von Achen both said they would abstain from Item 5.

PC Minutes 8/20/12 DRAFT

ITEM NO. 1 CONDITIONAL USE PERMIT FOR CREEKWOOD LAWN; 1753 N 700 RD (SLD)

CUP-12-00030: Consider a Conditional Use Permit for a truck storage facility for Creekwood Lawn, located at 1753 N 700 Road. Submitted by Shelby Franklin, property owner of record. *Joint meeting with Baldwin City Planning Commission.*

STAFF PRESENTATION

Ms. Sandra Day presented the item.

APPLICANT PRESENTATION

Mr. Shelby Franklin was present for questioning.

PUBLIC HEARING

No public comment.

COMMISSION DISCUSSION

Commissioner Hird said he was concerned with limiting the duration of Conditional Use Permits, particularly where a business was trying to obtain financing for an activity. He said a Conditional Use Permit that could expire prior to the end of the term of financing could become problematic from a banking standpoint. He said he would support the staff recommendation but in general was very reluctant to endorse a Conditional Use Permit with a short fuse on it.

Mr. Franklin said he was requesting the Conditional Use Permit due to financing reasons. He said the five year time duration was doable.

ACTION TAKEN

Motioned by Commissioner Blaser, seconded by Commissioner Hird to approve the Conditional Use Permit for a Truck/Equipment Storage Facility and forwarding of it to the County Commission with a recommendation for approval, based upon the findings of fact presented in the body of the staff report, and subject to the following conditions:

- 1. Provision of a note on the face of the site plan stating, "The Conditional Use Permit shall expire on December 31, 2017."
- 2. Provision of a revised site plan to include the following changes:
 - a. Show proposed electrical service to the existing building.
- 3. The applicant shall obtain from Douglas County a building permit as a condition of continued operation.
- 4. The applicant shall provide a revised site plan drawing to include the following information:
 - a. The limits of the floodplain need to be clearly shown and labeled on this site plan.
 - b. Note identifying the base flood elevation.
 - c. Note listing the floodplain panel number.
 - d. Note showing the current effective date (08-05-2010).
- 5. The applicant shall obtain from Douglas County a local floodplain development permit.
- 6. The applicant shall provide the following information for submission to the State Historic Preservation Officer:
 - a. Cover letter requesting review by the SHPO under K.S.A. 75-2724
 - b. Written description of the project
 - c. Location map showing the listed property and the location of the project
 - d. Photos of the site and photos of the view to and from the listed property

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PC Minutes 8/20/12 DRAFT ITEM NO. 2 IG TO CS; .25 ACRES; 444-446 LOCUST ST (MJL)

Z-12-00020: Consider a request to rezone approximately .25 acres from IG (General Industrial) to CS (Strip Commercial), located at 444 - 446 Locust Street. Submitted by Tiburcio J. Reyes Sr., property owner of record.

STAFF PRESENTATION

Ms. Michelle Leininger presented the item.

APPLICANT PRESENTATION

Mr. Tiburcio Reyes was present for questioning.

PUBLIC HEARING

No public comment.

ACTION TAKEN

Motioned by Commissioner von Achen, seconded by Commissioner Britton, to approve the request to rezone approximately .25 acres, from IG (General Industrial) District to CS (Commercial Strip) District based on the findings presented in the staff report and forwarding it to the City Commission with a recommendation for approval.

PC Minutes 8/20/12 DRAFT ITEM NO. 3 PRD & CO TO RM24; 11.93 ACRES; 525 CONGRESSIONAL DR (SLD)

Z-12-00029: Consider a request to rezone approximately 11.93 acres from PRD (Planned Residential Development) and CO (Office Commercial) to RM24 (Multi-Dwelling Residential), located at the northwest corner of W. 6th Street and Congressional Drive and currently addressed as 525 Congressional Drive. Submitted by Paul Werner Architects, for M & I Regional Properties LLC, property owner of record.

STAFF PRESENTATION

Ms. Sandra Day presented the item.

APPLICANT PRESENTATION

Mr. Paul Werner, Paul Werner Architects, agreed with the staff report and was present for any questions.

PUBLIC HEARING

No public comment.

ACTION TAKEN

Motioned by Commissioner Lamer, seconded by Commissioner Belt, to approve the request to rezone approximately 11.93 acres, from PD [Village Meadows]-Planned Residential Development District and CO (Commercial Office) to RM24 (Multi-Dwelling Residential) District based on the findings presented in the staff report and forwarding it to the City Commission with a recommendation for approval.

PC Minutes 8/20/12 DRAFT ITEM NO. 4 PRELIMINARY PLAT FOR GATEWAY ADDITION; 880 HWY 40 (MKM)

PP-5-6-12: Consider a Preliminary Plat for Gateway Addition, a 6 lot subdivision containing approximately 146 acres, located at 880 Hwy 40 (NW quadrant of the intersection of W. 6th St/Hwy 40 & Kansas Hwy 10 (K-10). Submitted by Landplan Engineering, for Hanover Place, L.C. and Tanglewood, L.C., property owners of record.

STAFF PRESENTATION

Ms. Mary Miller presented the item.

Commissioner Liese asked if the Planning Commission should consider the League of Women Voters recommendations.

Ms. Miller said the Planning Commission could take them into account.

APPLICANT PRESENTATION

Mr. Chris Storm, Landplan Engineering, was present for questioning.

PUBLIC COMMENT

<u>Mr. Shane Kahle</u> said overall he was pleased with the meetings with staff to work on the project. He said the neighbors still had a few concerns such as the true defined buffer space, the type of buffering that would be used, hours of construction, and the impact of the day to day routine. He felt it was a positive project as long as the neighbors concerns were taken into consideration.

Commissioner Belt asked if Mr. Kahle was asking for more time and input or if he was satisfied with the current version of the plat.

Mr. Kahle felt more time was always better. He wanted to be sure the neighbors concerns were adequately addressed.

COMMISSION DISCUSSION

Commissioner Belt asked what would happen with the plat if the project did not move forward.

Mr. McCullough said this was just a preliminary plat and there were other development steps. He said the rezoning would have to be approved by City Commission first. He stated the mayor and City Commission have been very vocal in wanting to know they have a specific project before development approval. He said at some point the land would be platted and zoned regardless of what the project was.

Commissioner von Achen inquired about access to homes.

Ms. Miller said there was a temporary cul-de-sac to the north that serves the houses and it would be removed when Aldersgate was constructed to the area.

Commissioner von Achen inquired about increased traffic.

Mr. McCullough said that was a concern the neighbors raised and there wasn't a perfect answer other than staff would look at any and every tool possible, but that traffic could not be restricted on a public road to the north. He said the intention was to do everything possible to deter traffic away from that property to the north.

Commissioner von Achen inquired about the Baldwin Creek change of alignment.

Mr. McCullough said it was an intermittent creek that does not have water in it all the time. He said it was an engineered system so it would not be seen until, and if, it opens up in certain areas. He said it was discussed opening it up as it reaches the property and then flowing into the detention/retention pond.

Mr. Storm said he had been working closely with the City Stormwater Engineer on the sizing and planning for the stormwater. He said it would be difficult to have an open channel due to the location of gas lines but that they were still in the process of looking at it.

Commissioner von Achen inquired about the distance that the creek would run underground.

Mr. Storm said somewhere around 1,500 feet. He said they were making sure it was properly sized so there would not be concerns with flooding.

Commissioner Blaser inquired about any costs to the church.

Mr. McCullough said KDOT was currently designing that stretch of 6th Street and that negotiation would primarily be between the church and KDOT.

Commissioner Culver applauded the neighbors for continuing to voice their input and applauded staff in working with the neighborhood and developers. He also thanked the developers for being willing to adjust the plan to address concerns.

ACTION TAKEN

Motioned by Commissioner Culver, seconded by Commissioner Blaser, to approve the Gateway Addition Preliminary Plat subject to the following conditions:

- 1. Provision of a revised plat with the following changes:
 - a. Addition of a note stating that additional right-of-way or easement for Hwy 40/W. 6th Street will be dedicated with the final plat if it is determined to be necessary for planned KDOT improvements.
 - b. Show access restriction along Hwy 40/W. 6th Street along all of the frontage not identified as access points.
 - c. Show the following access restrictions on Aldersgate: 300 ft from the perpendicular curb face of an intersecting arterial street and 250 ft from the perpendicular curb face of an intersecting collector or local street.
 - d. Address to the City Utility Engineer's satisfaction the technical comments provided by the City Utility Engineer in relation to water lines and sanitary sewer improvements.
- 2. Provision of a revised DSSA with the revisions noted in the staff report, per City Utilities Engineer approval.

Commissioner Hird said he would vote in favor of the motion but was concerned about the adequacy of egress and ingress for the project. He hoped it could be addressed as the project moved forward. He also agreed with Commissioner Culver's comment about the neighbors working hard with staff and developers in a cooperative manor.

Commissioner von Achen said she would vote in favor but was concerned about Horizon 2020 stating non-structural or natural approaches should be used for stormwater management systems design. She did not feel that was being done with this project.

Commissioner Lamer said he would vote in favor but had concerns about the channelization of the stream and encasement of the stream. He said he would like to see staff come back and explain at some point what alternatives were considered for this project.

Mr. McCullough said it was not atypical in a non-residential development to do exactly what was proposed with this project with an engineered solution to stormwater. He said laying down impervious materials would generate an increase in runoff and it would need to be accounted and accommodated for. He said this type of engineered encased structure was a common way to resolve issues. He said there were other green infrastructure ways to resolve issues. He said with this project the engineered solution was a concept that allowed for parking at the site and that parking was an element that would be needed. He said this solution was a way to accommodate both parking and stormwater.

Commissioner Britton asked if this approach was inconsistent with the Horizon 2020 language Commissioner von Achen mentioned.

Mr. McCullough said they try and meet the Horizon 2020 goals and policies when possible. He mentioned next month they would see a plat for the former Farmland Industries where they had the luxury of having the space available to do some unique green infrastructure in terms of stormwater. He said even grass and water was still an engineered structure, just not encased with parking over the top. He did not feel it was inconsistent because the Codes allow for it.

PC Minutes 8/20/12 DRAFT

ITEM NO. 5 TEXT AMENDMENT TO THE LAND DEVELOPMENT CODE; HOSPITAL USE (SLD)

TA-12-00023: Consider a Text Amendment to the City of Lawrence Land Development Code to amend uses in the Hospital (H) District, to change all P uses (Permitted Uses), *except for the Hospital Use*, to A uses (Accessory Uses) to identify the Hospital use as the only principal use in this district and all other uses allowed in this district to be accessory to the this principal use. Requested by Lathrop & Gage LLP, on behalf of Lawrence Memorial Hospital. *Initiated by City Commission on August 14, 2012.*

STAFF PRESENTATION

Ms. Sandra Day presented the item.

APPLICANT PRESENTATION

Mr. David Waters, Lathrop & Gage LLP, was present for questioning.

PUBLIC HEARING

No public comment.

COMMISSION DISCUSSION

Commissioner Blaser asked if they were initiating or taking action.

Mr. McCullough said City Commission initiated the text amendment and that Planning Commission would make a recommendation.

Commissioner Culver asked if there were any existing sites with the permitted use that would have a negative impact to change it to an accessory use.

Mr. McCullough said the Hospital use was only allowed in the H district and that there was only one property zoned Hospital. He said some of the uses being changed to accessory were permitted in other districts but that the Hospital use was only permitted in the Hospital district.

Commissioner Belt inquired what the advantage to changing to passive recreation would be.

Mr. McCullough said there would need to be a request for the Hospital district and that would be with the request for a new hospital within the community. He said the hospital was the primary use. He said it was unique and not the typical zoning. He said in this scenario any request with the H district would come along with community discussion about a hospital use.

Commissioner Hird said he had no problem with the proposed text amendment but wished Lawrence Memorial Hospital would have used a local attorney for the local hospital.

ACTION TAKEN

Motioned by Commissioner Hird, seconded by Commissioner Blaser, to approve the proposed text amendment and forward the recommendation for approval of TA-12-00023 to the Land Development Code to the City Commission with a recommendation for approval.

Motion carried 6-0-2, with Commissioners Britton and von Achen abstaining.

PC Minutes 8/20/12 **DRAFT** ITEM NO. 6 **REDEVELOPMENT PLAN**; 9TH & NEW HAMPSHIRE ST

Consider making a finding that the Redevelopment Plan for the proposed redevelopment at 9th and New Hampshire is consistent with the City's comprehensive plan.

STAFF PRESENTATION

Commissioner Belt said he had an ex parte conversation with Ms. Leslie Soden before the meeting.

Ms. Diane Stoddard, Assistant City Manager, presented the item.

Commissioner Liese inquired about what they should be focusing on.

Mr. McCullough said Ms. Stoddard's report outlined the specific scope of Planning Commission's responsibility which was land use and Horizon 2020 policies as they relate to downtown development.

Mr. Bill Fleming, Treanor Architects, said they scaled back the height of the building to accommodate some of the neighborhood requests.

PUBLIC HEARING

<u>Ms. Leslie Soden</u>, President of East Lawrence Association, said height and public financing were the main concerns of the neighborhood. She said Historic Resources Commission has denied this three times as damaging the historic environs of the North Rhode Island National Historic District. She said a petition was distributed in the Spring and in one week they gathered 179 signatures supporting Historic Resources Commission's decision that the building was too tall. She said Horizon 2020 specifically says sensitivity shall be given to important architectural historical elements. She said the League of Women Voters letter discussed public financing and the East Lawrence Association was also opposed to public financing for the project. She said public financing for a chain hotel that created temporary construction jobs and low wage part-time service jobs was not something public financing a competing publically financed hotel was a bizarre form of economic development. She stated if a business plan could not succeed without public finance than most people would change the business model so that it would work. She did not feel public financing to guarantee a return on investment was not an appropriate use of public funding.

Commissioner Liese asked if they were talking about the district tonight, not a specific project.

Mr. McCullough said the redevelopment plan had to be detailed enough so that they had enough information to judge whether it met the Comprehensive Plan. He said they knew a lot about the mixed use building and knew enough about the Salvation Army and Arts Center site to know how it would likely develop. He said Planning Commission needed to look at the development plan and policies and then move forward with their finding. He stated Historic Resources Commission had a narrow view and made a determination which stands as damaging the environs of the North Rhode Island District. He said past that the process involves an appeal to City Commission. He said City Commission had a different look at historic issues and had to make determinations based on the feasibility of the project and whether there were feasible and prudent alternatives to the project. He said that project ran its course with City Commission and they found there were no feasible and prudent alternatives so the project was allowed to move forward to this point. He said Planning Commission needed to look at the project overall with that information and decisions made.

<u>Ms. K.T. Walsh</u>, East Lawrence Neighborhood Association, asked if they were discussing the development proposal from 9th Street south. She asked if they were ignoring the north side completely tonight.

Mr. McCullough said yes.

COMMISSION DISCUSSION

Commissioner Hird said Planning Commissions job was not to decide whether this should receive public funding because that was not within their purview. He said Planning Commissions scope was to decide whether the project, including the architectural aspects, was consistent with Horizon 2020. He said there were three references to Horizon 2020 in the staff report. He wondered why the portion Ms. Soden cited, regarding the architectural aspect, was not in the staff report.

Ms. Soden said it was in the staff report.

Commissioner Belt said in the staff report there was a bit of a liability disclaimer in terms of focusing Planning Commission on a specific charge. He wondered if they would see more of these in the future because it would simplify the report and remind them of what they are doing every time.

Mr. McCullough said typically Planning Commissions charge was broader than this.

Commissioner Britton inquired about Horizon 2020 and project financing.

Mr. McCullough said there were encouragements of using incentives but it doesn't necessarily get into details about which one to use.

Commissioner Britton asked who was offering the incentives.

Mr. McCullough said in this case it would be the City offering an incentive package for the new hotel.

Commissioner Britton asked if the sentiment was still that the financing scenario for this project did not fall under those kinds of incentives.

Mr. McCullough said it could.

Commissioner Britton asked if they should be looking at this being an appropriate incentive.

Mr. McCullough said he did not know he would go to that great of detail with it, he did not think that was what this was saying. He did not believe that Planning Commission was to judge whether this was the appropriate incentive to use. He said what was highlighted in the policy was that incentives were appropriate for certain types of development and that City Commission was entertaining the incentives.

Commissioner Britton said when he originally read in the staff report *'Offer appropriate incentives for desired tourism development'* he assumed that this development would be preserving downtown.

Mr. McCullough said of the three items listed under *Conformance with the Comprehensive Plan* the other two were directly linked to the physical redevelopment plan. He said the development was a mixed-use development and was infill.

Commissioner Liese said he saw Commissioner Britton's point but he read it differently. He read it as Horizon 2020 saying it was good to offer appropriate incentives. He felt it was up to the legislatures to decide if the incentives were appropriate. He said the concept was one they should be thinking about not the dollars.

Commissioner Britton said he thought they read number three the same way. He said he read it whether the development offered incentives, not whether the City's incentives were appropriate.

Commissioner Blaser asked for clarification on what was considered an extended stay hotel.

Mr. Fleming said it generally had a few more amenities, such as refrigerator, stove, or kitchenette area so that people could prepare meals in the room if they wanted to. He said the idea was for people to stay typically 30 days or more.

Commissioner Blaser said an extended stay hotel was not something he would consider as a draw for tourism, especially since most tourists would not stay for 30 days.

Mr. McCullough said a big part of the TIF redevelopment plan was the Arts Center development that was supported by the policy of looking for ways to encourage tourism. He said the extended stay hotel would support tourism.

Commissioner Hird did not think it was within their purview to decide if financing was appropriate or not. He said it was important to him that it was an infill development because he would rather have an extended stay hotel in downtown where the people would be dining and shopping to support downtown, as opposed to being on the western fringes of the city. He said he was not convinced it was a tourist destination but considering it in conjunction with the first two standards that it supports downtown and was an infill development, it was persuasive that it was in conformance with the long term plan. He said he would leave it up to City Commission to debate the merits of financing. He stated given the narrow scope of Planning Commission he would support the staff recommendation.

ACTION TAKEN

Motioned by Commissioner Hird, seconded by Commissioner Blaser, to make a finding that the proposed plan for the redevelopment of the south portion of the Ninth and New Hampshire Project is consistent with the comprehensive general plan, Horizon 2020.

Commissioner Liese said they didn't know that it wouldn't encourage tourism and felt it could be a less expensive alternative to the Oread Hotel which may be desirable to tourists.

Mr. Fleming said they did a consultant study which provided data and assumptions. He said the data was based on a room rate of about \$93 a night.

Commissioner Liese said that would be about the same as the Oread Hotel.

Commissioner Belt asked if there were any other extended stay hotels in Lawrence.

Mr. Fleming said the Eldridge Hotel had a few extended stay type rooms.

Commissioner Liese asked who wrote in the staff report that an extended stay property would be a new product for Lawrence.

Ms. Stoddard said she drafted that language.

Commissioner Blaser said the new hotel by Hallmark Cards had all the same amenities that Mr. Fleming described as being in an extended stay.

Commissioner von Achen asked Ms. Stoddard to comment about the concern from the historical perspective of this hotel and the position the City was taking on it.

Ms. Stoddard said there were very specific legal steps that the City took. She said City Commission made a finding that there were no reasonable and prudent alternatives to the developer's proposal related to that site. She said in general City Commission was very cognizant of the historic nature of downtown and preserving downtown as a whole. She said they have been favorable toward the project as it relates to the first two items stated in the staff report. She said bringing additional development downtown would create a synergy of people to shop and utilize restaurants which would create economic activity for the long term and help preserve the community.

Commissioner Lamer addressed the three points in the staff report. He said preserving downtown as a mixed-use activity center was accomplished by this project. He said part of the key to having a mixed-use activity center was increasing the levels of density so he supported the project for that reason. He also felt it conformed to the comprehensive plan. He felt this was an appropriate location for infill. He said regarding appropriate incentives he did consider the incentive package put before the City. He said to his understanding it was a pay-as-you-go tax increment financing tool which was different than if they had come forward with some other type of incentive request such as a real property tax abatement.

Commissioner Culver asked if the two areas to the north and south would be treated independently ongoing.

Ms. Stoddard said there would be an overarching redevelopment agreement that would address the entire district. She said the only thing that would happen with having them on two different time frames was that the developer had an incentive to wait until they were ready to proceed with the north project, in a closer timeframe, before they would bring a redevelopment plan forward. She said the 20 year clock on the tax increment financing district would begin when a redevelopment was approved by City Commission. She said one could be on a 20 year tract and the other on a separate 20 year tract, a few years apart from each other.

Commissioner Culver said based on the relevant items presented in the staff report he would support the motion because he felt it conformed to the comprehensive plan.

Commissioner Britton said he was sensitive and sympathetic to Ms. Soden's concerns but felt accommodations had been made even if they were not to everybody's satisfaction. He felt the financing incentives were appropriate as discussed by Commissioner Lamer. He said he would support the motion.

Commissioner Blaser said he agreed with everything that had been said but felt the incentives were to attract tourism, not to incent the developer. He said a small grocery store would be a larger incentive for downtown. He said he would support the motion.

Commissioner Liese thanked Ms. Soden for voicing her opinion this evening. He said he would support the motion based on the comments already made by Commissioner Lamer.

Unanimously approved 8-0.

MISCELLANEOUS NEW OR OLD BUSINESS

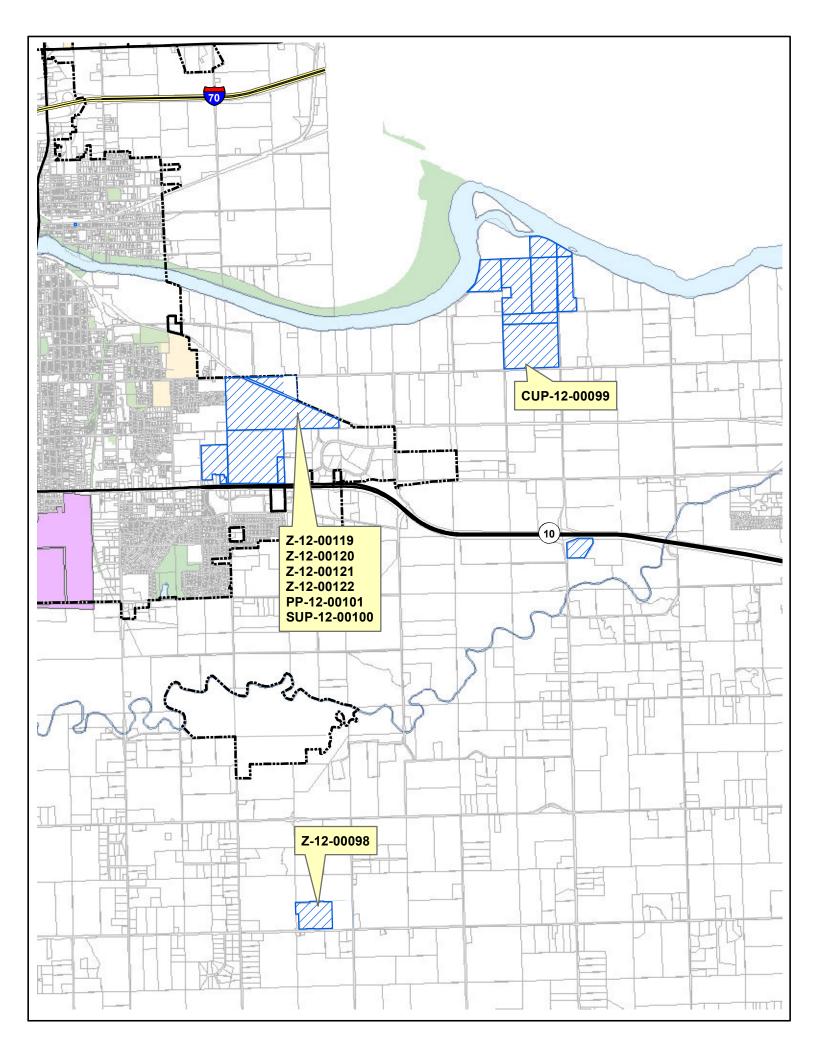
Consideration of any other business to come before the Commission.

Commissioner Liese asked the Planning Commissioners to check the Mid-Month calendar for dates and topics and that they were mandatory meetings.

ADJOURN 8:40pm

Mid-Month Meetings, Wednesdays	Mid-Month Topics			Me	Planning Commission Meetings 6:30 PM,	
7:30 – 9:00 AM				Mon	& Wed	
Jan 11	Industrial Distr	ricts TA		Jan 23	Jan 25	
Feb 8	Agritouris	sm		Feb 27	Feb 29	
Mar 14	Northeast Sect	tor Plan		Mar 26	Mar 28	
Apr 11	"Planning for Planning: What we need to	do at our up	coming orientation."	Apr 23	Apr 25	
May 9	APA Conference	follow-up		May 21	May 23	
Jun 13				Jun 25	Jun 27	
Jul 13	PC Orientation – all day Friday			Jul 23	Jul 25	
Aug 8	Legal Review – Start at 8:00AM			Aug 20	Aug 22	
Sep 12	Comprehensive Plan – What's it all about & review of Goals and Policies			Sep 24	Sep 26	
Oct 10	Development Review Process	Development Review Process Elements of a Site Plan		Oct 22	Oct 24	
				Nov 12	Nov 14	
				Dec 10	Dec 12	
	Suggested topics for future meetings: How City/County Depts interact on planning issues Stormwater Stds Update – Stream Setbacks Overview of different Advisory Groups – potential overlap on pla Open Space Acquisition/Funding Mechanisms – what do other st Library Expansion Update Joint meeting with other Cities' Planning Commissions Joint meeting with other Cities and Townships – UGA potential r	tates do?	Presentation from KC-metro Planni Tour City/County Facilities 2010 Census Data Oread Overlay Districts KDOT 5-County Regional Transpor US40/K-10 Area Transportation Pla Water/Wastewater Master Plan Up	tation Study		
Meeting Locations	The Planning Commission meetings are held in the Massachusetts Streets, unless otherwise noticed.	City Commis	sion meeting room on the 1 st	floor of City Hall, 6	^{bh} &	

Revised 7/20/12



Memorandum City of Lawrence Planning & Development Services

- TO: Planning Commission
- CC: Scott McCullough, Director of Planning and Development Services Sheila Stogsdill, Assistant Planning Director
- FROM: Mary Miller, City/County Planner
- Date: September 21, 2012
- RE: ITEM NO. 1: CONDITIONAL USE PERMIT FOR PENNY SAND PIT; N 1500 RD & E 1850 RD (MKM) For September 24, 2012 Planning Commission meeting

Two errors were identified in the staff report for the CUP referenced above. Changes have been made and the corrected staff report placed in the Planning Commission agenda packet. The following changes were made to Section VI of the report (Page 10):

1. The applicant's response to the factor "RELATIVE GAIN TO THE PUBLIC HEALTH, SAFETY AND WELFARE BY THE DESTRUCTION OF THE VALUE OF THE PETITIONER'S PROPERTY AS COMPARED TO THE HARDSHIP IMPOSED UPON THE INDIVIDUAL LANDOWNERS" was corrected. Staff had inserted the wrong response for this question. The corrected response is: "*No identifiable gain will result by denial of this request: no identifiable hardship*

"No identifiable gain will result by denial of this request; no identifiable hardship will result from its approval."

2. The first paragraph in Section VI was revised. This paragraph incorrectly noted that the subject property was located outside the Eudora Wellhead Protection Zone. The property had been identified as being within the western reaches of the Protection Zone on Page 7 of the staff report, under the heading "Proposed Uses" and in Figure 3. The revised language is:

"Evaluation of the relative gain weighs the benefits to the community-at-large vs. the benefit of the owners of the subject property. There are many factors to consider when locating a sand pit, and this location meets the geographic criteria of being outside the FAA 10,000 ft wildlife mitigation area, has good access to the arterial roadway system, and is in a lowly populated area. Denial of the request for a Conditional Use Permit would affect the individual landowner by prohibiting the use of the property for the off-river sand dredging pit."

PLANNING COMMISSION REPORT Regular Agenda Joint Meeting with Eudora Planning Commission

PC Staff Report 09/24/12 (Corrected) ITEM NO. 1: CONDITIONAL USE PERMIT FOR PENNY SAND PIT; N 1500 RD & E 1850 RD (MKM)

CUP-12-00099: Consider a Conditional Use Permit for sand excavation and extraction for Penny Sand Pit, approximately 434 acres located on the NE Corner of N 1500 Road & E 1850 Road. Submitted by Landplan Engineering, for William Penny & Van LLC, property owners of record. *Joint meeting with Eudora Planning Commission.*

STAFF RECOMMENDATION: Staff recommends approval of the Conditional Use Permit for Penny Sand Pit and forwarding it to the Board of County Commissioners with a recommendation for approval based on the findings of fact found in the body of the staff report subject to the following conditions:

- 1) The approval is contingent upon the issuance of all State and/or Federal permits which are required for this operation including the Army Corps of Engineers.
- 2) An agreement designating responsibility for the ongoing maintenance of the berms to the property owner shall be executed and recorded with the Register of Deeds prior to the release of the CUP plans to the Zoning and Codes Office. A copy of the agreement shall be provided to the Planning Office for the file.
- 3) A copy of the easement for the off-site access drive shall be provided to the Planning Office for the file prior to the release of the CUP plans to the Zoning and Codes Office.
- 4) The applicant shall obtain a Flood Plain Development Permit from the Director of Zoning and Codes prior to the release of the CUP plans.
- 5) The reclamation plan shall be revised with the following changes prior to release of the CUP plans:
 - a. The plan shall note the requirement that the lake that is being created will have a varied shoreline and will appear natural in appearance.
 - b. The plan shall note that the intended use of the lake, when mining and reclamation is complete, is to be a recreational feature.
 - c. The plan shall note the maximum slope of the lake shoreline for a specified depth to insure that the slopes are of a grade that it would be possible for a person or animal that accidentally entered the lake to exit.
 - d. The plan shall explain the sequential nature of the reclamation process; that overburden produced in one phase will be used to reclaim previously excavated areas.
 - e. The reclamation plan shall note that topsoil will be placed over the overburden in areas that are to be reclaimed as farmland, shoreline, or berms. If topsoil is to be stockpiled and stored it must be vegetated to prevent erosion.
- 6) The applicant shall submit a revised CUP plan with the following changes:
 - a) A detailed landscaping plan for the buffer area surrounding the McElwee house will be submitted.

- b) The Book and Page number of the recorded easement for the off-site access road shall be noted on the CUP plan.
- c) The ownership shall be noted as Van, LLC as well as Penny's Concrete Inc. on the CUP plan.
- d) The on-site residential structure on the east side of the property will be shown on the CUP plan as on the reclamation plan.
- e) If stockpiling of overburden is to occur on the subject property, the CUP or operation plan should note the maximum height and approximate location. The stockpiles should be placed as far from the existing residences as possible.
- f) List the following CUP conditions on the plan:
 - i. Hours of operation are 6:30 AM to 6:30 PM, Monday through Friday. No removal, transfer, or placement of overburden is permitted outside these operating hours; however dredging and extraction of sand may exceed these hours when necessary.
 - ii. The approval for this Conditional Use is valid for 30 years. An extension request for the CUP must be submitted prior to the expiration date or a new CUP application must be submitted. The Zoning and Codes office shall conduct 5 year administrative reviews to insure compliance with the CUP, operation, and reclamation plans.
 - iii. The only exterior lighting in the areas to be excavated will be the headlights on the dredge.
- iv. The scale house, processing plant, sediment pond, and stockpile area, approved with CUP-2-2-79, will be used to serve the subject property.
- v. Sales of overburden, topsoil, sand or aggregate products will occur only on the portion of the property that contains the scale house on the CUP plan.
- vi. Truck traffic will utilize Noria Road (E 1750 Road), and is restricted from using N 1500 Road or E 1850 Road.
- vii. The applicant shall work with the Army Corps of Engineers to determine how the existing wetlands on the property will be treated. Prior to any excavation in Phase 21, the applicant will provide documentation to the Planning Office on the wetlands indicating whether the wetlands will be maintained on site or if they will be mitigated elsewhere. If the wetlands will be maintained on site, the operation plan will be revised to include the protection measures and the property owner shall submit a revised CUP plan for administrative review/approval of the wetland setbacks. If the wetlands are to be mitigated, a revised CUP plan shall be submitted to note the removal of the wetlands.
- 7) The following improvements to nearby roads and intersections shall be completed per the County Engineer's approval before issuance of a permit for the Conditional Use :
 - a. Realignment of the entrance to the sand facility so that it opposes the Noria Road intersection at N 1500 Road.
 - b. Pavement of a 100 ft long section of the site access drive just north of N 1500 Road, as recommended in the TIS.
 - c. Reconstruction of pavement in the Noria Road (E 1750 Road)/N 1500 Road intersection. The existing surfacing is likely a crushed rock base that has been chip sealed. This will not stand up to the increased truck traffic crossing N 1500 Road.
 - d. Construction of an eastbound right turn lane on Route 442 (N 1400 Road) at Route 1057 (E 1900 Road). This is mentioned as a desirable improvement in the TIS. Pavement on the existing shoulder at this location is not adequate for the projected amount of truck traffic.

Reason for Request:

"The owner wishes to conduct sand excavation, extraction and processing operations on the subject property in conjunction with the existing agricultural uses."

KEY POINTS

- Per Section 12-319-4.11 of the Zoning Regulations for the Unincorporated Territory of Douglas County, mining and excavation uses are permitted in the A and V-C Districts when approved as a Conditional Use.
- The area is encumbered with floodplain including the regulatory floodway and floodway fringe of the Kansas River.
- Previous Conditional Use Permits were approved for the river dredging operation to the north and northwest of the subject property. The Conditional Use Permits are not being combined with this request; however, the processing plant and access drive on the property with the previous Conditional Use Permits will be utilized. These previous Conditional Use Permits are discussed in more detail later in the report.

ATTACHMENTS

- **A** Public Communications received prior to printing of this staff report.
- **B** Traffic Impact Study and Addendum
- C Plans
- **D** Ground Water Report

DESCRIPTION OF USE

The applicant is requesting a Conditional Use Permit to allow pit dredging on the subject property. The applicant has an existing Conditional Use Permit for river dredging in the property along the river, north of the subject property [CUP-2-2-79] and a CUP was approved for river dredging on the property to the west owned by David and Carmiletta Penny. The applicant has been operating the two river dredging operations and intends to utilize the access drive which was constructed for the river dredging facilities. The intent is also to use the same processing plant, currently located in the middle of the existing stockpiles; however, it will be moved to the subject property in the location marked on the CUP plan after the first few phases. The reclamation plan indicates that portions of the property will be reclaimed for agricultural uses and the remainder will be reclaimed as a lake.

ASSOCIATED CASES/OTHER ACTION REQUIRED

- Approval of Conditional Use Permit by Board of County Commissioners.
- Conditional Use Permit Plan released to the Zoning and Codes Office.
- Issuance of permit for the Conditional Use by the Zoning and Codes Office following application and determination that all conditions have been met.

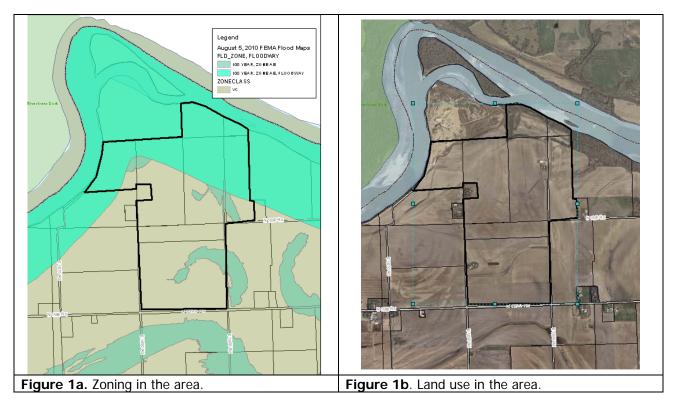
PUBLIC COMMENT RECEIVED PRIOR TO PRINTING

- August 9th phone call from Carl McElwee, adjacent property owner listing the following concerns with the project: 1) unstability of the river bank, 2) possible pollution of the aquifer, and 3) loss of prime agricultural soils.
- Staff met with Carl McElwee on August 31st to discuss his concerns with the CUP. Mr. McElwee provided a letter and reference material which is included in Attachment A.
- Petition from nearby property owners on September 17th in opposition to the sand pit.
- Letter from David Penny, president of Master's Dredging Company, requesting deferral. This letter is included in Attachment A.
- Letter from Carl McElwee on September 18th in opposition to the deferral request, Attachment A.

GENERAL INFORMATION

Current Zoning and Land Use:	V-C (County- Valley-Channel), F-W (Floodway Overlay) and F-F (Floodway Fringe Overlay) Districts; rural residential and agriculture.
Surrounding Zoning and Land Use:	To the west: V-C (Valley-Channel), and F-W (Floodway Overlay) Districts; rural residential and agriculture. To the north: V-C (Valley-Channel), and F-W (Floodway Overlay) Districts; river dredging operation approved with CUP-2-2- 79 and the Kansas River. To the east: V-C (Valley-Channel), F-W (Floodway Overlay) and F-F (Floodway Fringe Overlay) Districts; rural residential and agriculture. To the south: V-C (Valley-Channel), and F-F (Floodway Fringe Overlay) Districts; rural residential and agriculture. (Figure 1)

Site Summary:	
Subject Property:	465 acres
Proposed Buildings:	No new buildings are being proposed.
Off Street Parking Required:	1 space per 2 employees. 4 employees/ 2 spaces are required.
Off Street Parking Provided:	2 spaces provided on property to north, included within CUP-2-2-79.



I. ZONING AND USES OF PROPERTY NEARBY

The subject property contains approximately 465 acres and is located northwest of the intersection of N 1500 and E 1900 Roads in portions of Sections 25, 26, 35, and 36 in Township 12 South, Range 20 East.

The nearby area is zoned V-C (Valley Channel), a protective zoning district that was created prior to the construction of Clinton Dam and development of the FEMA Flood Insurance Rate Maps for property which was prone to flooding. The V-C District permits the following limited land uses: agricultural land uses, public or private commercial recreational facilities and structures, open space, and farm dwellings provided a minimum area of 5 acres per dwelling unit is provided. Per Section 12-319-4.05, mining, extraction, and excavation of raw materials in the V-C District require approval of a Conditional Use Permit (CUP) and approval of a reclamation plan. Land uses in the area include rural residences, agricultural land uses, and mining/excavation land uses approved with CUPs. Conditional Use Permits which have been approved in this area for sand dredging are listed below and the areas included are shown in Figure 2.

- A Conditional Use Permit application, CUP-2-2-79, for river dredging was submitted in 1979 for the area north of the subject property. Planning Commission voted to recommend approval at their April 25, 1979 meeting.
- A Conditional Use Permit application, CUP-1-3-91, was submitted in 1991 for approximately 130 acres located to the west of the subject property to permit river dredging along the shore and pit dredging on the remainder. The Planning Commission voted to recommend approval of the river dredging at their March 27, 1991 meeting but voted to recommend denial of the pit operation at their May 22, 1991 meeting. The minutes indicated the vote for denial was based primarily on concerns with the possibility of contamination of ground water and local wells and the possibility of the pit accelerating the changing of the river's course.
- Various extensions were approved for CUP-1-3-91 and a new file number, CUP-3-3-01, was assigned in 2001 for that extension. On December 17, 2001, the County Commission approved a 5 year extension of the CUP through December 31, 2006. CUP-1-3-91 expired as the Corps of Engineer permit was issued after the expiration date of Dec. 31, 2006.
- CUP-06-04-08 was submitted in 2008 to replace the expired CUP-1-3-91. Planning Commission voted to recommend approval at their August meeting. County Commission approved the CUP on September 17, 2008. The CUP will expire December 31, 2012 unless a new Army Corps of Engineers permit is obtained and approved by the Zoning and Codes Director.



Figure 2. Approximate area included in CUPs for sand dredging in the area. Previously approved CUPs outlined in red, subject property in black.

Staff Finding – The area is zoned V-C (Valley Channel) and portions are encumbered by the Regulatory Floodway and the Regulatory Floodway Fringe. The predominate land uses in the area are agriculture, mining and extraction, and rural residential. The proposed land use, mining and excavation, is permitted in the V-C District and has been approved in the area.

II. CHARACTER OF THE AREA

The subject property is located east of the City of Lawrence and is outside of, and adjacent to, the Urban Growth Area boundary. This is an agricultural area with scattered rural residences. Natural features in the area include the Kansas River, which borders the area to the north and is the dividing line between Douglas and Leavenworth Counties; riparian woodlands along the Kansas River; floodplain; and high quality agricultural soils. The property has good access to the transportation network through N 1500 Road, which is classified as a minor collector on the Major Thoroughfares Map. N 1500 Road connects E 15th Street with County Route 1061 (E 2200 Road), both classified as minor arterials.

Staff Finding – This is predominately an agricultural area with scattered rural residences, floodplain, and natural resources in the form of sand reserves and high quality agricultural soils. N 1500 Road, a minor collector, provides a connection through the area to minor arterials to the east and west.

III. SUITABILITY OF SUBJECT PROPERTY FOR THE USES TO WHICH IT HAS BEEN RESTRICTED

Applicant's response:

"A Conditional Use Permit (CUP) was granted to Dunbar in 1979 for removal of sand from the river bank. The original permit covered an area approximately 114 acres gross in size which is approximately located in the northwest corner of the CUP request. The mining is a use that is allowed in V-C (Valley Channel)."

Existing Uses

Uses allowed in the V-C District include farms, truck gardens, orchards, nurseries, grazing, hunting and fishing, public or private commercial recreation facilities and structures, preserves, reservations and other similar open uses, and farm residences when located on a minimum of 5 acres. Mining and excavation activities are permitted as a Conditional Use. A Conditional Use requires approval though a public review process. Section 12-319 of the County Zoning Regulations states:

"Recognizing that certain uses may be desirable when located in the community, but that these uses may be incompatible with other uses permitted in a district, certain conditional uses listed in Section 12-319-4 below, when found to be in the interest of the public health, safety, morals and general welfare of the community may be permitted, except as otherwise specified, in any district from which they are prohibited."

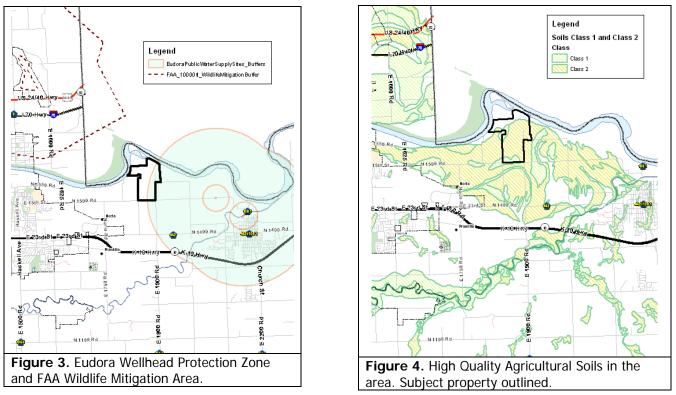
The property is partially encumbered by the Regulatory Floodway and Regulatory Floodway Fringe. Per Section 12-328 of the County Zoning Regulations, the purpose of the floodplain management regulations is to protect individuals and property from flood hazards or flooding by providing for the orderly and safe development of the floodplain for the most advantageous uses which are consistent with the health, safety, and welfare of the general public. Any development in the area requires review and issuance of a floodplain development permit by the Zoning and Codes Office.

Proposed Uses

The property has many features which suit it well for the mining and excavation use which is being requested. It is located adjacent to the Kansas River in an area with sand reserves and has good access to the major transportation network. The property is located at the western reaches of the Eudora Wellhead Protection Zone and is outside the FAA 10,000 ft Wildlife Mitigation Area. (Figure 3) Conditional Use Permits for river dredging have been approved for the property to the north and an off-site access drive was constructed to accommodate this facility. There is little residential development in the area; however, 4 residences are within very close proximity to the area proposed to be pit mined with 2 of these being located on the subject property. The area is not served by a rural water district, but relies on well water. Care must be taken through the approval and operation process to minimize any negative impacts to the nearby residences.

The subject property is located in a large contiguous area of high quality agricultural soils. (Figure 4) There is a conflict between the two natural resources in that the removal of the underground sand deposits will remove the high quality soils in this location. The fact that sand reserves are typically located near the river, and often within the floodplain makes it difficult to avoid locating in areas with high quality soils.

Staff Finding – The property is well suited to the agricultural and residential uses to which it has been restricted by the V-C Zoning District. The property is also suited to the Conditional Use of mining and excavation provided that appropriate measures are taken to minimize negative impacts on nearby residences. A policy decision for the Commission would be a decision regarding the competing natural resources in the area: high quality agricultural soils and off-river sand reserves.



IV. LENGTH OF TIME SUBJECT PROPERTY HAS REMAINED VACANT AS ZONED

Staff Finding – The V-C District permits limited development of agricultural, recreational uses or farm residences. The property has been used for farming and 2 farm residences were constructed on the property in the early 1900s. There has been no other development on the subject property.

V. EXTENT TO WHICH REMOVAL OF RESTRICTIONS WILL DETRIMENTALLY AFFECT NEARBY PROPERTY

Applicant's Response:

"No detriment to nearby properties will occur. This CUP request maintains existing agricultural uses on the land while adding employment and revenue opportunities in northeast Douglas County. The Corps of Engineers regulate the mining activity on the river along with several other governmental agencies which require permits."

The proposed use will produce permanent changes in the area. Agricultural uses will continue as mining occurs by phase; however, eventually all phases will be mined. The reclamation plan shows some areas being returned to farmland, particularly around the residence on the east side of the property and the area in the northwest corner of the subject property adjacent to the Kansas River and the rest being reclaimed as a lake. An access drive installed for an earlier CUP will be utilized and this will have direct access to a paved road.

Sand pits have the possibility to detrimentally affect nearby properties through the following:

- **Stockpiles**: Overburden, topsoil, and finished products of sand and aggregate will be stockpiled on the area. The placement, height, and maintenance of stockpiles to prevent dust pollution are important considerations to reduce any negative impact. The applicant indicated that overburden would be used primarily to construct the perimeter berms and for reclamation of previously excavated phases. If stockpiling of overburden is proposed on the subject property, the CUP plan should note the maximum height and location. The stockpiles should be kept as far from the existing residences as possible to reduce visual impact.
- **Ground water:** As mentioned earlier, properties in this area are not served by public water and must rely on well water. The mining will occur above and below the water table. It would be important to study any impact the mining activity could have on the quality of ground water and the quantity available to nearby wells. The applicant provided a study on the impact of the mining activity on groundwater. The study looked at wells which are registered with Division of Water Resources, Kansas Department of Agriculture. It is important to note that some wells in the area were installed prior to the requirement to register. The study was prepared by Carl E. Nuzman, P.E., P.HG, a consulting engineer and hydrogeologist. The following are excerpts taken from the study:
 - a. The report provided the following information on the quantity of water available for the wells: *"A well can decrease in yield due to biological fouling and lack of property maintenance but unless the static water level has a substantial decline reducing the saturated thickness, the yield available from the aquifer remains constant."* (Page 5, Nuzman report.)
 - b. And the following recommendation in relation to the McElwee well: *"The C. McElwee domestic well is up-gradient from the sand pit and down-gradient from the Kansas River. Although the property is about 5 acres in area, it is recommended that the set back of the pit mining be 300 feet from his property line. The radius of influence of the domestic well is less than 300 feet and will not be adversely affected by the sandpit." (page 8, Nuzman report.)*
 - c. Regarding the impact of the sand pit on the quantity of water available for other wells in the area: *"Sand pits beneficially support the yield of wells that are down-gradient from a pit that is within the area of influence of a well."* (Page 8, Nuzman report.)

d. "Due to the hydraulic gradient of the valley aquifer system and recharge to the aquifer from rainfall, the aquifer flow to the City wells is from the west-southwest. The Penny sand pit will be a half mile north of the capture zone of the City wells and will have no influence on the Eudora public water supply wells." (page 7, Nuzman report)

The report recommended that a 300 ft setback be maintained between the property boundary of any residence out parcel and the active dredging of sand from the pit and concluded that the proposed sand pit lake that will be developed will have no effect on the McElwee wells, Public Wholesale Water Supply District No. 25 or the City of Eudora's wells or water supply. The applicant provided a revised CUP plan with the 300 ft setback shown.

- **River channel:** Concern was raised that allowing the pit mining to occur so close to the river could accelerate a change in the river channel, especially during flood events. The river is naturally working to change its channel in this location. Wakefield Dort, a retired KGS professor, examined the channel changes in the Kansas River and Carl McElwee provided an excerpt of one of his publications in his materials. Staff contacted a hydrologist with the USGS (United States Geological Survey) Midwest Division, Kyle E Juracek, for his opinion on the impact of the dredging operation and pit on the river channel. Mr. Juracek indicated that the location of a lake could result in channel change in the event of a flood but pointed out that the river channel may change as a result of a flooding event even without a lake in close proximity. Riprap including large pieces of concrete and smaller infill pieces has been placed on the Kansas River shore to stabilize it since the river dredging operation began.
- Visual impact: To minimize the visual impact on nearby properties, particularly the residential properties that are in close proximity to the mining area, it is necessary to establish well-landscaped buffers and to place limits on the location and height of stockpiled materials. The Operation Plan indicates that excess overburden and topsoil might be sold. To minimize activity near these residences, sales should be by delivery only or occur on the northern area where the scale house is shown on the CUP. The reclamation plan should provide details about the lake which is to be created, showing the approximate boundaries, and shape. Development of a lake that is an attractive natural feature could be a positive impact on the area.
- Traffic: The applicant provided a Traffic Impact Study (TIS) and addendum which are included with this report as Attachment B. The TIS estimated that on a high production day as many as 200 trucks a day could be expected (400 truck trips as these would be round trips). The increase in truck traffic that would result from the sand plant expansion would be 20 trucks a day (40 trip-ends, 20 in and 20 outbound trips). The applicant's consultant provided an amended TIS which explains that the traffic generation estimated in the original TIS assumed that the river dredging operation and the sandpit operation would be occurring concurrently. The applicant indicated that the primary reason for the expansion of the plant is to switch over the river dredging to off-river pit dredging maintaining its current rate of sand distribution at approximately 1,000 (+/-) tons on an average day. The TIS indicates that all truck traffic will utilize Noria Road, and will not use N 1500 Road; this should be listed as a condition on the CUP plan. When the sand pit dredging operation replaces the river dredging the estimated number of trucks serving the site will be around 40 trucks per day. The consultant also clarified that the 200 trucks per day estimate was based on a high productivity day, 5000 tons, which may still occur but on a very infrequent basis.

Based on this information, traffic can be assumed to be about 40 trucks a day on an average day and up to 200 trucks a day on a high productivity day.

These documents were provided to the County Engineer for review, and also to the City Engineer as some of the roads used to access the plant lie within the City of Lawrence. The County Engineer recommended the following improvements to nearby roads and intersections to accommodate the increased traffic associated with the sand pit:

- a. Realignment of the entrance to the sand facility so that it opposes the Noria Road intersection at N 1500 Road.
- b. Pavement of a 100 ft long section of the site access drive just north of N 1500 Road, as recommended in the TIS.
- c. Reconstruction of pavement in the Noria Road (E 1750 Road)/N 1500 Road intersection. The existing surfacing is likely a crushed rock base that has been chip sealed. This will not stand up to the increased truck traffic crossing N 1500 Road.
- d. Construction of an eastbound right turn lane on Route 442 (N 1400 Road) at Route 1057 (E 1900 Road). This is mentioned as a desirable improvement in the TIS. Pavement on the existing shoulder at this location is not adequate for the projected amount of truck traffic.

These changes shall be noted as conditions of approval which must be met before the Conditional Use Permit is issued.

• Activity: A sand pit operation includes the removal of overburden with heavy equipment, the dredging of sand, processing and sale of the sand/aggregate products, and reclamation activities. These activities could have an impact on surrounding properties due to lighting or noise. The operation plan indicates that typical hours of operation will be Monday through Friday from 6:30 AM to 6:30 PM. There may be extenuating circumstances which would require operation on Saturdays or for dredging to occur beyond the regular hours of operation due to the nature of the construction business. The operation of the dredge should be low impact as the 4 headlights that are on the dredge provide the only lighting when operating at night and the dredge operates relatively quietly. It should be noted as a condition of approval that no removal, transfer, or placement of overburden which requires heavy equipment would be permitted outside these operating hours. This will serve to keep the higher intensity uses within the regular business hours.

Staff Finding –Potential negative impacts the proposed use could have on nearby properties include the noise and activity associated with the mining, reduced visual appeal created by stockpiles of overburden or topsoil, impacts on well water, and traffic. Conditions should be placed the CUP to minimize potential negative impacts on nearby properties.

VI. RELATIVE GAIN TO THE PUBLIC HEALTH, SAFETY AND WELFARE BY THE DESTRUCTION OF THE VALUE OF THE PETITIONER'S PROPERTY AS COMPARED TO THE HARDSHIP IMPOSED UPON THE INDIVIDUAL LANDOWNERS

Applicant's Response: "No identifiable gain will result by denial of this request; no identifiable hardship will result from its approval."

Evaluation of the relative gain weighs the benefits to the community-at-large vs. the benefit of the owners of the subject property. There are many factors to consider when locating a sand pit, and this location meets the geographic criteria of being outside the FAA 10,000 ft wildlife mitigation area, has good access to the arterial roadway system, and is in a lowly populated area. Denial of the

request for a Conditional Use Permit would affect the individual landowner by prohibiting the use of the property for the off-river sand dredging pit.

Denial of the CUP request may benefit the area property owners by preventing the proposed mining activity and possible negative impacts. Denial may benefit the public by retaining the high quality soils. Denial may also detrimentally affect the public in that it will prohibit production of sand and aggregate materials from a local source. With the recent move away from river dredging, appropriate locations for pit mining must be found.

Staff Finding – Denial of the CUP would result in a hardship to the applicant and public in that it would prohibit the applicant from operating a sand pit to produce sand and aggregate products from local reserves. Denial of the CUP may benefit the public at large by maintaining the high quality soils which are present. To weigh the benefit the denial of the CUP would have on the public, protection of high quality soils, versus the impact it would have, loss of potential sand and aggregate production from a local source, it is necessary to choose between these two natural resources in this location.

VII. CONFORMANCE WITH THE COMPREHENSIVE PLAN

The subject property is not located within an identified urban growth area. The comprehensive plan recommends that agricultural uses continue to be the predominant land use within the areas of the county beyond the designated urban growth areas. Uses permitted in the rural area should continue to be limited to those which are compatible with agricultural production and uses. The mining activity and the resultant lake would be compatible with agricultural production and uses.

Chapter 16 Policy 2.7 "Encourage the protection of High Quality Agricultural Land in Douglas County for current and future agricultural use." (page 16-15, Horizon 2020)

This policy contains the following 4 steps to encourage the protection of High Quality Agricultural Land:

- Including the protection of High Quality Agricultural Land as a key assumption in the sector planning process.
- Establishing tools to protect High Quality Agricultural Land for farming and make its protection economically feasible for the land owner.
- Maintaining an inventory of High Quality Agricultural Land in Douglas County and track the amount lost to urbanization.
- Encourage and develop policies that support agri- and eco-tourism.

Chapter 16: *Resource Management*

"This section encourages the responsible use of marketable natural resources within Douglas County through proper extraction and reclamation methods. They are essential to sustainable development activity, primarily in the form of low cost raw materials, such as sand, gravel, timber, oil, gas, and stone, etc." (page 16-21, Horizon 2020)

The Comprehensive Plan recommends both the encouragement of the protection of High Quality Agricultural Land and the responsible use of marketable natural resources.

Staff Finding – The proposed use is in general conformance with the recommendations in the Comprehensive Plan; however, it is proposing the use of marketable natural resources rather than the protection of High Quality Agricultural Land.

STAFF REVIEW

As discussed earlier, there are two approved Conditional Use Permits for river dredging in this area, CUP-2-2-79 and CUP-06-04-08. CUP-06-04-08 replaced an expired Conditional Use Permit, CUP-1-3-91, which had requested both river and pit mining for the area to the west of the subject property (Figure 2). The river dredging request was approved but the pit dredging request was denied. CUP-2-2-79 was approved for the property to the north of the subject property. The processing plant, scale house and stockpiles are currently located on this property. The scale house and stockpiles would remain in this location; however, the processing plant would be located to the east onto the property within the current CUP in later phases of excavation. An easement was dedicated in 1979 for the access drive and this access drive will continue to provide access for the subject property. A copy of this easement shall be provided to the Planning Office for the file.

Most of the neighbor's concerns were addressed in an earlier section of this report dealing with possible negative impacts to surrounding properties; however, another concern was raised regarding the perpetual maintenance of the berms in the future to insure that stormwater runoff does not enter the lake. Staff recommends that an agreement placing the responsibility for the perpetual maintenance of the berms on the property owner should be executed and recorded with the Register of Deeds prior to the release of the CUP permit.

Wetlands are present on the subject property as shown on the CUP plan. The applicant's intention is to either protect the wetlands or mitigate them off-site; however, the decision has not been made at this time. The applicant shall work with the Army Corps of Engineers to determine how the existing wetlands on the property will be treated. Prior to any excavation occurring in the phase adjacent to the phase containing the wetlands, the applicant should provide documentation to the Planning Office indicating the plans for the wetlands, whether they will be maintained on site or if they will be mitigated elsewhere. If the wetlands are to be maintained, the operation plan should be revised to include the protection measures and the revised plan should be submitted to the Planning Office for administrative approval of the wetland setbacks and protection measures.

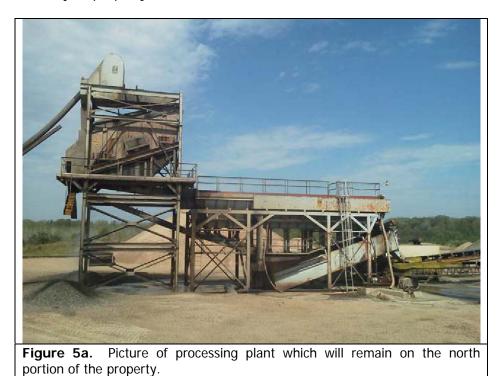
The applicant indicated that their long term plan for the area is to reclaim the areas to farmland as shown on the reclamation plan and to create a lake for recreational use in the remainder. A note should be added to the reclamation plan which indicates that the lake will be contoured with a more natural shape than the rectangular shape shown on the plan and to note the intended use following reclamation.

The previously approved CUP restricted sand pit access on E 1810 Road to employees and required customers and commercial trucks to use the established access drive. A note to this effect should be included on the CUP plan.

Due to the nature of mining and excavation uses, the approval time frames are typically for 30 years. This allows time for the mining, excavation and reclamation of the land. An extension request may be submitted to the Planning Office for public hearing before the Planning Commission and action by the County Commission. The Zoning and Codes office shall conduct 5 year reviews to insure compliance with the CUP, operation, and reclamation plans.

The applicant explained the mining process will begin with excavation of the overburden in Phase 1 and the dredge will be moved in for removal of sand when possible. A picture of the dredge and the processing plant is included in Figure 5. The mine is to be sequentially reclaimed which means that that earlier phases will be in the reclamation process as later phases are being excavated. The first few phases are planned to be reclaimed as farm land so overburden from later phases will be placed in the area to be reclaimed. Topsoil will then be applied and vegetation planted. As they move

through the phases the overburden will be excavated and placed within the previously created pit. Overburden will also be used to create the perimeter berms which will keep stormwater runoff from surrounding areas from entering the lake. This is an important step is preventing pollution of ground water. There may be some incidental sales of excess overburden or topsoil but this would occur on the property with the scale house. All stockpiling of finished material will occur on the area designated on CUP-2-2-79. A note should be added to the plan that states that the area shown on CUP-2-2-79 with the scale house, processing plant, sediment pond, and stockpile area will also be used to serve the subject property and CUP.





Public Communications

Public Communications included with this staff report in Attachment A include a letter from adjacent land owner, Carl McElwee, expressing his concerns with the possible impact the proposal may have on the area; a petition signed by neighbors in opposition to the project; a request for deferral from adjacent property owner, Dave Penny, and a letter of opposition to the deferral request from Carl McElwee. The concerns raised in Carl McElwee's letter have been discussed throughout this staff report. Staff does not typically make recommendations when deferrals are requested, but the letters have been provided for the Commission's consideration.

Joint Hearing

County Resolution No 80-5 established the policy that a joint hearing be held for requests within 3 miles of the incorporated cities in Douglas County so that the County Commission would have the benefit of both Planning Commissions' recommendations. The subject property is approximately 2 miles west of the Eudora City Limits; therefore, a joint meeting is being held between the Lawrence/Douglas-County Metropolitan Planning Commission and the City of Eudora Planning Commission and their recommendations will be forwarded to the Board of County Commissioners.

Conclusion

Approval of a Conditional Use can be tailored to address specific issues such as intensity or frequency of use, include time limitations, and provide screening requirements. The recommended conditions respond to the specific nature of this request. The sand pit, as conditioned, should be compatible with nearby land uses.

Aug. 30, 2012

Lawrence Douglas County Metropolitan Planning Office 6 East 6th Street, P.O. Box 708, Lawrence, KS 66044

Planning Staff:

My name is Carl McElwee and I live at 1564 E. 1850 Rd. I have lived at this location since 1975 (37 years this November). I am writing this letter to object to the Conditional Use Permit (CUP) that Penny Sand Co. has applied for near my house. This CUP asks permission to surround my house on 3 sides with a pit mining operation for sand removal. This would completely change my immediate surroundings which I have enjoyed for so long. If allowed this CUP would subject me and my family to dramatically increased industrial activity, including noise, dust, and environment destruction. This will undoubtedly dramatically affect my property values.

The affected area has some interesting Douglas County history associated with it. It was obtained very early by the Altenbernd family. Penny Sand has acquired much of the land as elder Altenbernds have died. On the land currently owned by Penny and covered under this CUP there exist two historic houses. One is an early stone homestead house and one is a classic two story farm stead that dates to approximately 1910. There is no mention of what will become of these structures in the CUP. I hope they will be preserved and that this CUP will not be allowed to detract from their historic value. My house was also built by an Altenbernd. As best we can tell it was built in about 1919 and is a classic Craftsman Bungalow style. My wife and I have lived here 37 years and raised our two children here. We do not want to see this environment affected by an ugly and destructive sand mining operation.

This will create a huge strip mining operation that will severely impact the local environment. Naturally, I am opposed to the CUP because of the impact on my property. However, I would like to lay out some scientific reasons why this CUP should be denied. I am a retired Geology Professor from KU and have spent a 35 year career there studying groundwater. I have worked extensively at a research site in the Kansas River Valley just northeast of the Lawrence Airport. So I am qualified to comment on the scientific aspects of the situation.

My scientific bases for opposing this CUP are as follows:

(1) The river bank in the vicinity of this proposed pit mining operation is unstable and has moved considerably over recent times, as shown by the work of Dr. Dort of the KU Geology Department. I have included copies of pertinent pages of his work. It shows that this area is unstable and the river is trying to make a straighter course, cutting off the existing meander. If pit mining is allowed in this area, in times of flood the chances of a dramatic river channel change is magnified greatly. An open pit with a small buffer

region from the river in the vicinity of this unstable bend would make it easy for the flooding river to make a sudden change in direction.

(2) On this proposed 434 acre pit mining site, the majority of the area is covered by some of the highest quality soils as defined by the US Department of Agriculture. I have included a USDA Soil Report and some pages from the 1977 Douglas County Soils Survey to support this. It seems very short sighted to produce sand for short term gain and lose the potential for significant food and fiber production indefinitely. You will notice that the USDA report shows this area as being rated as poor for sand production. This is probably because of the large amount of overburden (unusable soil, silt and clay) that must be removed. I have included three well drilling logs that show 23-24 feet of soil, silt and clay exist in the vicinity of my property. Removing this much overburden will create a very environmentally difficult situation. The spoil piles must be dealt with, not allowing runoff into the river. At the same time surface runoff must not be allowed into the pit because of possible pollution of the aquifer. There is great potential for operational missteps to create environmental problems. We have all seen the detrimental effects of strip mining elsewhere; I hope we can avoid them here.

(3) Opening this pit operation will expose one of the most prolific aquifers in this region to potential pollution. The very sand that they desire to excavate is the material that forms this prolific aquifer. I have included a few pages from a Kansas Geological Survey Bulletin by Fader that shows the characteristics of this aquifer. In general, groundwater in the aquifer moves down the valley from West to East. This aquifer is a magnificent resource that must be protected and preserved for the future. It is capable of producing vast amounts of water for irrigation and public water supply. In the future water may be one of our most valued resources. The alluvial material (loose material, soil, silt, clay, sand) in the river valley varies in depth, but about 70 feet is a good average number. The better sand is near the bottom, so the mining will proceed to the bedrock (harder material). The better sand near the bottom is also the main aquifer of the river valley. The overlying soil, silt, and clay protect the aquifer from surface pollutants. By removing this overburden the aquifer is exposed to potential pollution from surface runoff and anything that is spilled into the pit. In particular, my well would be very close to the proposed pit mine and could be affected by the operation, as could several other neighboring house wells. Just down the valley about 1 5/8 miles lies the Eudora Public Water Supply Well Field (See enclosed map); it could also be affected by the proposed pit mining operation. I do not believe that Penny Sand Co. can guarantee that no pollution will occur. Penny Sand Co will tell us that they will engineer solutions that will prevent any pollution or problems; however, I do not think the risk of a potential engineering failure is appropriate. After the 30 year CUP has finished the pit will remain, who will continue to maintain the site and guarantee aquifer integrity?

Thank you for your consideration. If I may answer any questions, please contact me.

Carl McElwee 1564 E. 1850 Rd. Lawrence, KS 66046 785-843-4164 cmcelwee@ku.edu



BULLETIN 206, PART 2

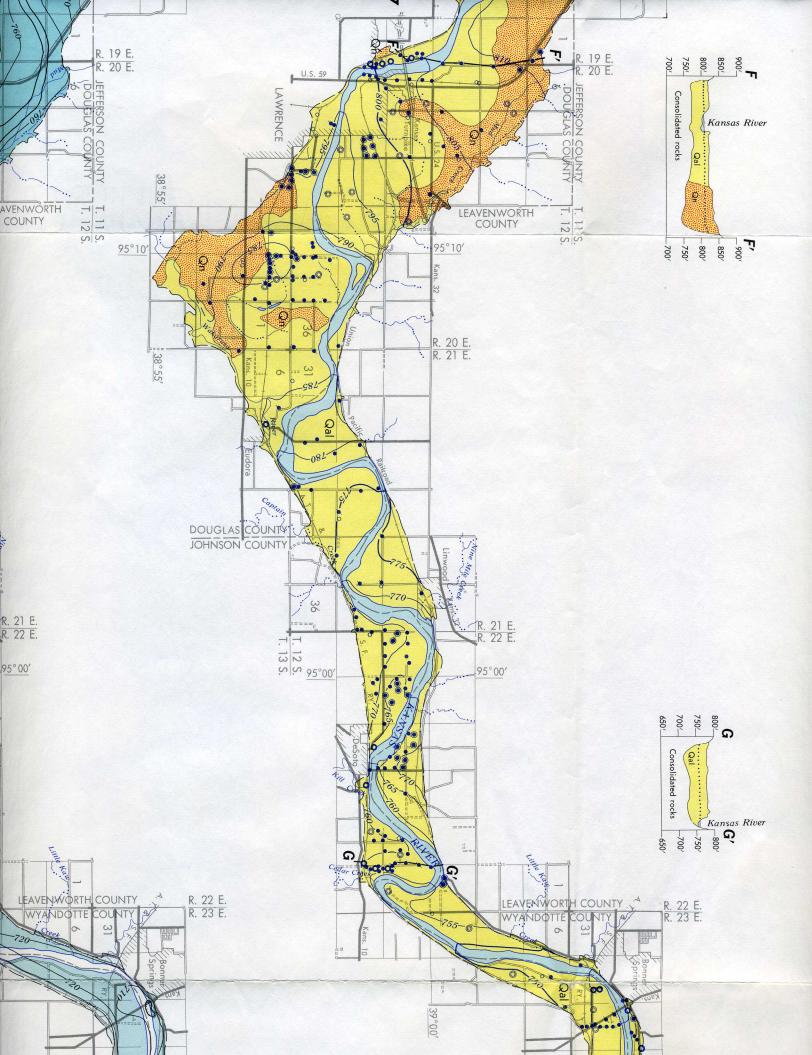
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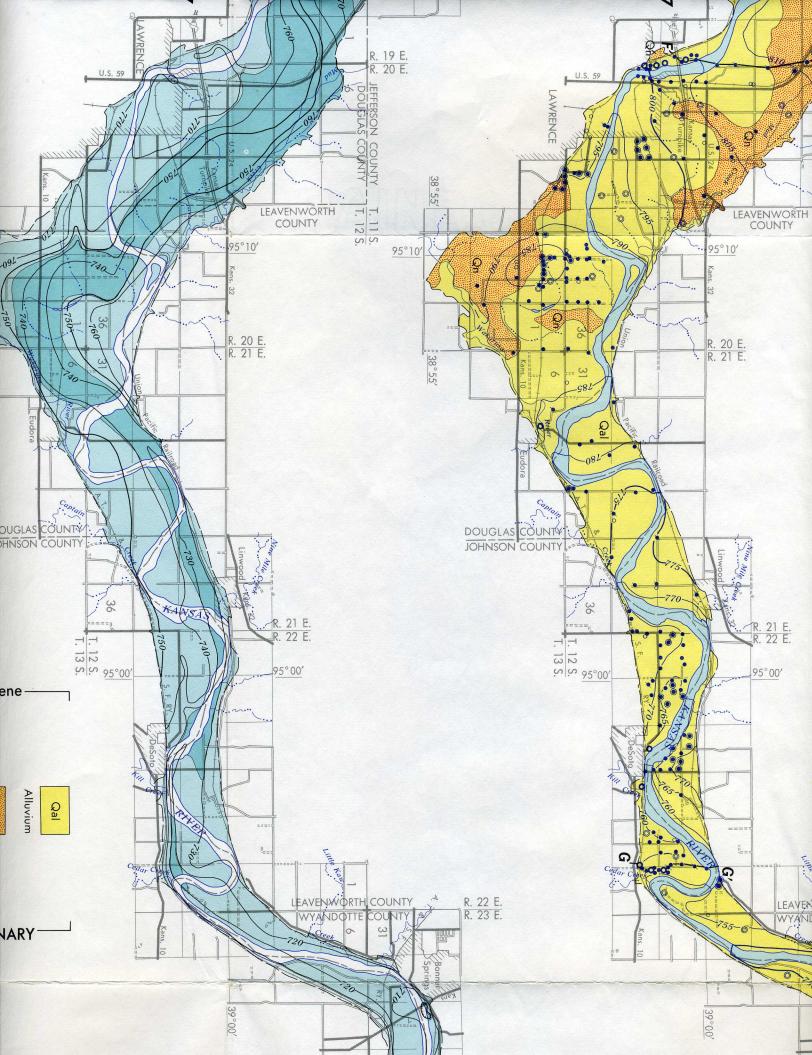
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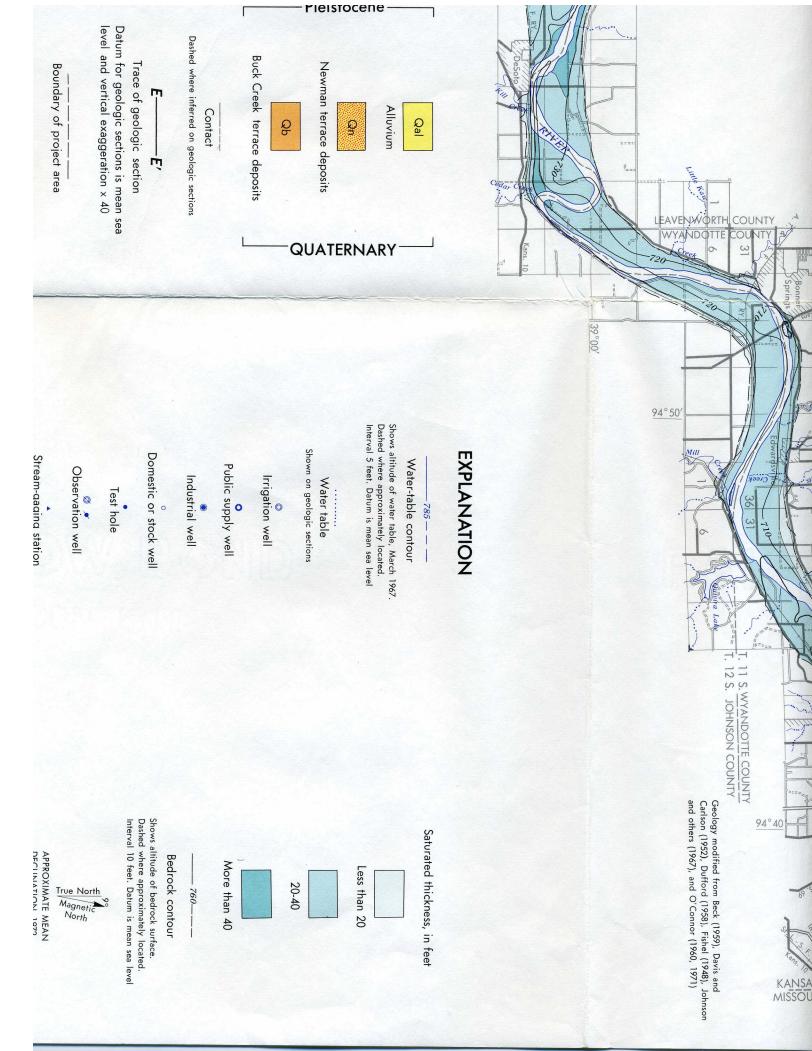
Stuart W. Fader

Prepared by the State Geological Survey of Kansas and the United States Geological Survey, with the cooperation of the Division of Water Resources of the Kansas State Board of Agriculture and the Division of Environmental Health of the Kansas State Department of Health.

> Printed by authority of the State of Kansas Distributed from Lawrence UNIVERSITY OF KANSAS PUBLICATIONS JANUARY 1974







STATEMENT

March 24, 2004

H

Carl McElwee

1564 E 1850 Rd Lawrence, Ks. 66046

STRADER DRILLING COMPANY, INC.

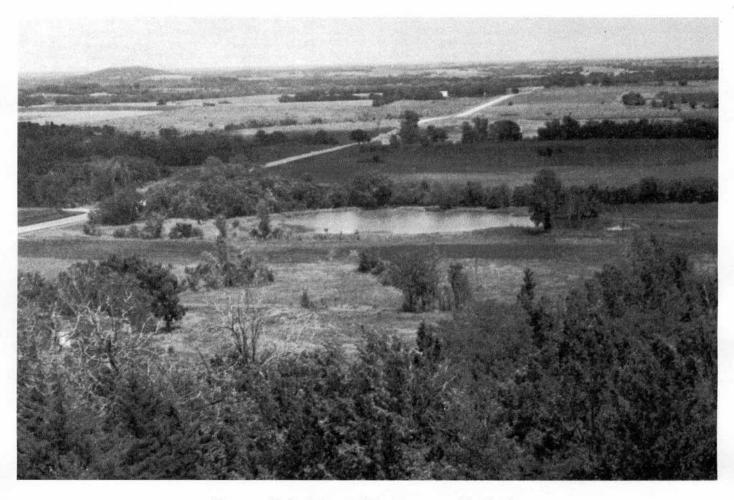
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NOTICE: We do not make installment or credit sales. All accounts are due upon receipt of billing. A delinquency charge of 11/26 per month (18% per year) will be added to accounts not paid within 30 days from invoice date.

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Drill Logs 1 April D6 Carl AlcElwee's Sacres SE Corner 300'N of SE corner black soil 0-4 black soil 0-5 gray brown clay 5-23 4-23 brown clay med coarse sad 23-28 23-38 pink-brown sand 28-38 Coarse sand 38-54 green sand green sand 54 crunchy (boulders? 38-42 gray clay stringer? 42 54-65 green sand 65 light brown limestr green sal 42-50 hand - (boulders?) 50 50-66 green sand light brown limestone 66

SOIL SURVEY OF Douglas County, Kansas





United States Department of Agriculture Soil Conservation Service In cooperation with Kansas Agricultural Experiment Station

SOIL SURVEY

TABLE 2.-Yields per acre of crops and pasture

[All yields were estimated for a high level of management in 1974. Only arable soils are listed]

Soil name and map symbol	Corn	Grain sorghum	Soybeans	Wheat	Alfalfa hay	Smooth bromegrass
Eudora:	Bu	Bu	Bu	Bu	Ton	AUM 1
Et Ev ² Ew ²	110 100 105	112 100 106	45 40 42	50 43 47	5.6 5.0 5.5	6.5 6.2 6.3
Gymer: Gm Gy	90 83	94 90	38 35	42 40	4.3 4.0	5.5 6.1
Judson: Ju	109	111	44	52	5.6	7.0
Kennebec: Kb	103	98	40	42	5.5	6.5
Kimo: Km	85	90	38	40	4.5	5.5
Leanna: Le	80	85	32	36	4.0	7.0
Martin: Mb Mc Mh ² Mo ³	80 75 50 68	85 80 59 78	35 31 24 30	40 38 26 37	3.9 3.6 2.9 3.4	5.5 5.5 4.5 5.0
Morrill: Mr Ms	80 68	85 75	32 28	40 37	4,0 3.5	6.5 6.0
Oska: Oe	67	79	32	38	3.4	5.4
Pawnee: Pb Pc Ph	73 68 44	80 75 55	34 30 23	38 35 26	3.8 3.6 2.7	6.0 5.5 4.5
Reading: Re	103	106	44	50	5.6	6.5
Sarpy: Sb ²	70	80	30	35	5.0	3.9
Sharpsburg: Sc Sd	95 90	95 90	38 36	42 41	4.7 4.5	6.8 6.5
Sibleyville: Sh So St ² St ³ , Sv ²	62 52 54	73 57 60	25 21 22	34 28 29	3.6 3.0 3.2	6.0 5.0 4.5 5.2
Thurman: Tc	60	60	22	32	3.0	5.0
Vinland: Vc ^a	48	55	23	27	2.2	4.0
Wabash: Wc Wh	82 65	88 65	37 31	38 32	4.0 3.0	6.0 5.5
Woodson: Wo ws wxs Wx	65 65 50	75 75 55	28 24 20	34 32 25	$3.5 \\ 3.5 \\ 2.3$	5.0 5.0 4.5

¹Animal-unit-month (AUM) is a term used to express the carrying capacity of pasture. It is the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for a period of 30 days.

² This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.





United States Department of Agriculture



Natural Resources Conservation Service A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Douglas County, Kansas

Sand Pit Site



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app? agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/ state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soillandscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map (Sand Pit Site)



	MAP L	EGEND		MAP INFORMATION
Area of Inte	erest (AOI)	۵	Very Stony Spot	Map Scale: 1:10,100 if printed on A size (8.5" × 11") sheet.
	Area of Interest (AOI)	*	Wet Spot	
Soils			Other	The soil surveys that comprise your AOI were mapped at 1:24,000.
	Soil Map Units	Special	Line Features	Warning: Soil Map may not be valid at this scale.
•	Point Features Blowout	\sim	Gully	
•		1.1.1	Short Steep Slope	Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line
	Borrow Pit	~-	Other	placement. The maps do not show the small areas of contrasting
*	Clay Spot	Political F	eatures	soils that could have been shown at a more detailed scale.
•	Closed Depression	•	Cities	
×	Gravel Pit	Water Fea	itures	Please rely on the bar scale on each map sheet for accurate map measurements.
~	Gravelly Spot	\sim	Streams and Canals	
۵	Landfill	Transport		Source of Map: Natural Resources Conservation Service
٨	Lava Flow	+ + +	Rails	Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov Coordinate System: UTM Zone 15N NAD83
علد	Marsh or swamp	~	Interstate Highways	
*	Mine or Quarry	\sim	US Routes	This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.
0	Miscellaneous Water	~~	Major Roads	
۲	Perennial Water	\sim	Local Roads	Soil Survey Area: Douglas County, Kansas
~	Rock Outcrop			Survey Area Data: Version 8, Nov 30, 2010
+	Saline Spot			Date(s) aerial images were photographed: 6/15/2006
::	Sandy Spot			The orthophoto or other base map on which the soil lines were
=	Severely Eroded Spot			compiled and digitized probably differs from the background
\$	Sinkhole			imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.
\$	Slide or Slip			or map unit boundaries may be evident.
ø	Sodic Spot			
	Spoil Area			
0	Stony Spot			
0	, opot			

Map Unit Legend (Sand Pit Site)

Douglas County, Kansas (KS045)								
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI					
7035	Eudora-Bismarckgrove fine sandy loams, overwash, occasionally flooded	61.6	16.5%					
7089	Stonehouse-Eudora fine sandy loams, overwash, occasionally flooded	12.1	3.2%					
7123	Eudora silt loam, rarely flooded	48.9	13.1%					
7127	Eudora-Kimo complex, overwash, rarely flooded	240.6	64.5%					
9995	Sand Pits	10.0	2.7%					
Totals for Area of Inter	est	373.1	100.0%					

Map Unit Descriptions (Sand Pit Site)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic classes rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic

classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Douglas County, Kansas

7035—Eudora-Bismarckgrove fine sandy loams, overwash, occasionally flooded

Map Unit Setting

Elevation: 750 to 980 feet *Mean annual precipitation:* 31 to 47 inches *Mean annual air temperature:* 52 to 55 degrees F *Frost-free period:* 175 to 215 days

Map Unit Composition

Eudora and similar soils: 55 percent *Bismarckgrove and similar soils:* 25 percent *Minor components:* 0 percent

Description of Eudora

Setting

Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Coarse-silty alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water capacity: High (about 11.1 inches)

Interpretive groups

Land capability (nonirrigated): 2w Ecological site: Loamy Lowland (PE 30-37) (R106XY013KS)

Typical profile

0 to 7 inches: Fine sandy loam 7 to 14 inches: Silt loam 14 to 40 inches: Silt loam 40 to 48 inches: Silt loam 48 to 80 inches: Very fine sandy loam

Description of Bismarckgrove

Setting

Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Silty alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water capacity: High (about 10.6 inches)

Interpretive groups

Land capability (nonirrigated): 2w Ecological site: Loamy Lowland (PE 30-37) (R106XY013KS)

Typical profile

0 to 6 inches: Fine sandy loam 6 to 14 inches: Silty clay loam 14 to 19 inches: Silty clay loam 19 to 29 inches: Silt loam 29 to 44 inches: Silt loam 44 to 80 inches: Stratified loamy fine sand to fine sandy loam

Minor Components

Aquolls

Percent of map unit: 0 percent Landform: Depressions, drainageways, hillslopes Down-slope shape: Concave Across-slope shape: Concave

7089—Stonehouse-Eudora fine sandy loams, overwash, occasionally flooded

Map Unit Setting

Elevation: 750 to 980 feet *Mean annual precipitation:* 31 to 47 inches *Mean annual air temperature:* 52 to 55 degrees F *Frost-free period:* 175 to 215 days

Map Unit Composition

Stonehouse and similar soils: 50 percent Eudora and similar soils: 30 percent Minor components: 0 percent

Description of Stonehouse

Setting

Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Sandy alluvium

Properties and qualities

Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Drainage class: Excessively drained Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: Occasional Frequency of ponding: None Calcium carbonate, maximum content: 5 percent Available water capacity: Low (about 5.4 inches)

Interpretive groups

Land capability (nonirrigated): 4s Ecological site: Sandy Lowland (PE 30-37) (R106XY023KS)

Typical profile

0 to 9 inches: Fine sandy loam 9 to 23 inches: Loamy fine sand 23 to 31 inches: Stratified loamy sand 31 to 45 inches: Stratified fine sand 45 to 71 inches: Stratified sandy loam 71 to 80 inches: Stratified loamy fine sand

Description of Eudora

Setting

Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Coarse-silty alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water capacity: High (about 11.1 inches)

Interpretive groups

Land capability (nonirrigated): 2w Ecological site: Loamy Lowland (PE 30-37) (R106XY013KS)

Typical profile

0 to 7 inches: Fine sandy loam 7 to 14 inches: Silt loam 14 to 40 inches: Silt loam 40 to 48 inches: Silt loam 48 to 80 inches: Very fine sandy loam

Minor Components

Aquolls

Percent of map unit: 0 percent Landform: Depressions, drainageways Down-slope shape: Concave Across-slope shape: Concave

7123—Eudora silt loam, rarely flooded

Map Unit Setting

Elevation: 800 to 1,050 feet *Mean annual precipitation:* 31 to 47 inches *Mean annual air temperature:* 52 to 55 degrees F *Frost-free period:* 175 to 215 days

Map Unit Composition

Eudora and similar soils: 85 percent *Minor components:* 0 percent

Description of Eudora

Setting

Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Coarse-silty alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water capacity: High (about 11.8 inches)

Interpretive groups

Land capability (nonirrigated): 1 Ecological site: Loamy Lowland (PE 30-37) (R106XY013KS)

Typical profile

0 to 7 inches: Silt Ioam 7 to 14 inches: Silt Ioam 14 to 40 inches: Silt Ioam 40 to 48 inches: Silt Ioam 48 to 80 inches: Very fine sandy Ioam

Minor Components

Aquolls, ponded

Percent of map unit: 0 percent Landform: Depressions Down-slope shape: Concave Across-slope shape: Concave

Aquolls

Percent of map unit: 0 percent Landform: Depressions, drainageways, hillslopes Down-slope shape: Concave Across-slope shape: Concave

7127—Eudora-Kimo complex, overwash, rarely flooded

Map Unit Setting

Elevation: 400 to 1,200 feet *Mean annual precipitation:* 31 to 47 inches *Mean annual air temperature:* 52 to 59 degrees F *Frost-free period:* 175 to 215 days

Map Unit Composition

Eudora and similar soils: 60 percent *Kimo and similar soils:* 30 percent *Minor components:* 5 percent

Description of Eudora

Setting

Landform: Flood plains Down-slope shape: Linear Across-slope shape: Linear Parent material: Coarse-silty alluvium

Properties and qualities

Slope: 0 to 2 percent *Depth to restrictive feature:* More than 80 inches *Drainage class:* Well drained

Custom Soil Resource Report

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr) Depth to water table: More than 80 inches Frequency of flooding: Rare Frequency of ponding: None Available water capacity: Very high (about 12.2 inches)

Interpretive groups

Land capability (nonirrigated): 2w Ecological site: Loamy Lowland (PE 30-37) (R106XY013KS)

Typical profile

0 to 12 inches: Silt loam 12 to 72 inches: Silt loam

Description of Kimo

Setting

Landform: Flood plains Down-slope shape: Linear Across-slope shape: Linear Parent material: Clayey over loamy alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 22 to 26 inches
Frequency of flooding: Rare
Frequency of ponding: Occasional
Available water capacity: High (about 11.4 inches)

Interpretive groups

Land capability (nonirrigated): 2w Ecological site: Loamy Lowland (PE 30-37) (R106XY013KS)

Typical profile

0 to 6 inches: Silty clay loam 6 to 28 inches: Silty clay 28 to 60 inches: Silt loam

Minor Components

Wabash

Percent of map unit: 5 percent Landform: Flood plains Landform position (three-dimensional): Tread Other vegetative classification: CLAY LOWLAND (PE30-37) (106XY004KS_1)

9995—Sand Pits

Map Unit Setting

Mean annual precipitation: 31 to 47 inches Frost-free period: 175 to 215 days

Map Unit Composition Pits, sand: 100 percent

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Construction Materials

This folder contains a collection of tabular reports that present soil interpretations related to sources of construction materials. The reports (tables) include all selected map units and components for each map unit, limiting features and interpretive ratings. Construction materials interpretations are tools designed to provide guidance to users in selecting a site for potential source of various materials. Individual soils or groups of soils may be selected as a potential source because they are close at hand, are the only source available, or they meets some or all of the physical or chemical properties required for the intended application. Example interpretations include roadfill, sand and gravel, topsoil and reclamation material.

Source of Sand and Gravel (Sand Pit Site)

This table gives information about the soils as potential sources of gravel and sand. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. Only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness. The ratings are for the whole soil, from the surface to a depth of about 6 feet.

The soils are rated *good*, *fair*, or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Source of Sand and Gravel (Sand Pit Site)

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.00 to 0.99. The larger the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel]

Source of Sand and Gravel– Douglas County, Kansas								
Map symbol and soil name	Pct. of	Potential as a source of	gravel	Potential as a source of sand				
	map unit	Rating class and limiting features	Value	Rating class and limiting features	Value			
7035—Eudora-Bismarckgrove fine sandy loams, overwash, occasionally flooded								
Eudora	55	Poor		Poor				
		Bottom layer	0.00	Bottom layer	0.00			
		Thickest layer	0.00	Thickest layer	0.00			
Bismarckgrove	25	Poor		Poor				
		Bottom layer	0.00	Bottom layer	0.00			
		Thickest layer	0.00	Thickest layer	0.00			

Source of Sand and Gravel– Douglas County, Kansas								
Map symbol and soil name	Pct. of	Potential as a source of	gravel	Potential as a source of sand				
	map unit	Rating class and limiting features	Value	Rating class and limiting features	Value			
7089—Stonehouse-Eudora fine sandy loams, overwash, occasionally flooded								
Stonehouse	50	Poor		Fair				
		Bottom layer	0.00	Thickest layer	0.03			
		Thickest layer	0.00	Bottom layer	0.13			
Eudora	30	Poor		Poor				
		Bottom layer	0.00	Bottom layer	0.00			
		Thickest layer	0.00	Thickest layer	0.00			
7123—Eudora silt loam, rarely flooded								
Eudora	85	Poor		Poor				
		Bottom layer	0.00	Bottom layer	0.00			
		Thickest layer	0.00	Thickest layer	0.00			
7127—Eudora-Kimo complex, overwash, rarely flooded								
Eudora	60	Poor		Poor				
		Bottom layer	0.00	Bottom layer	0.00			
		Thickest layer	0.00	Thickest layer	0.00			
Kimo	30	Poor		Poor				
		Bottom layer	0.00	Bottom layer	0.00			
		Thickest layer	0.00	Thickest layer	0.00			
9995—Sand Pits								
Pits, sand	100	Not rated		Not rated				

Source of Sand and Gravel (Sand Pit Site)

This table gives information about the soils as potential sources of gravel and sand. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. Only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness. The ratings are for the whole soil, from the surface to a depth of about 6 feet.

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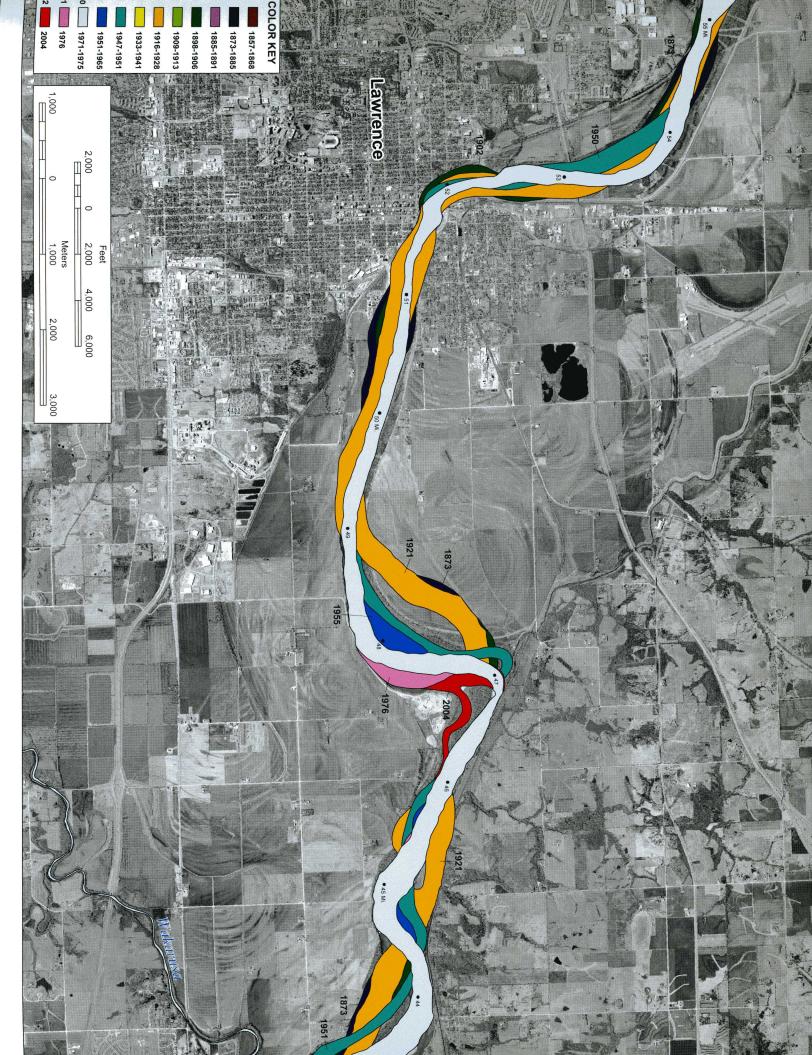
HISTORICAL **CHANNEL CHANGES** OF THE **KANSAS RIVER** AND ITS MAJOR TRIBUTARIES

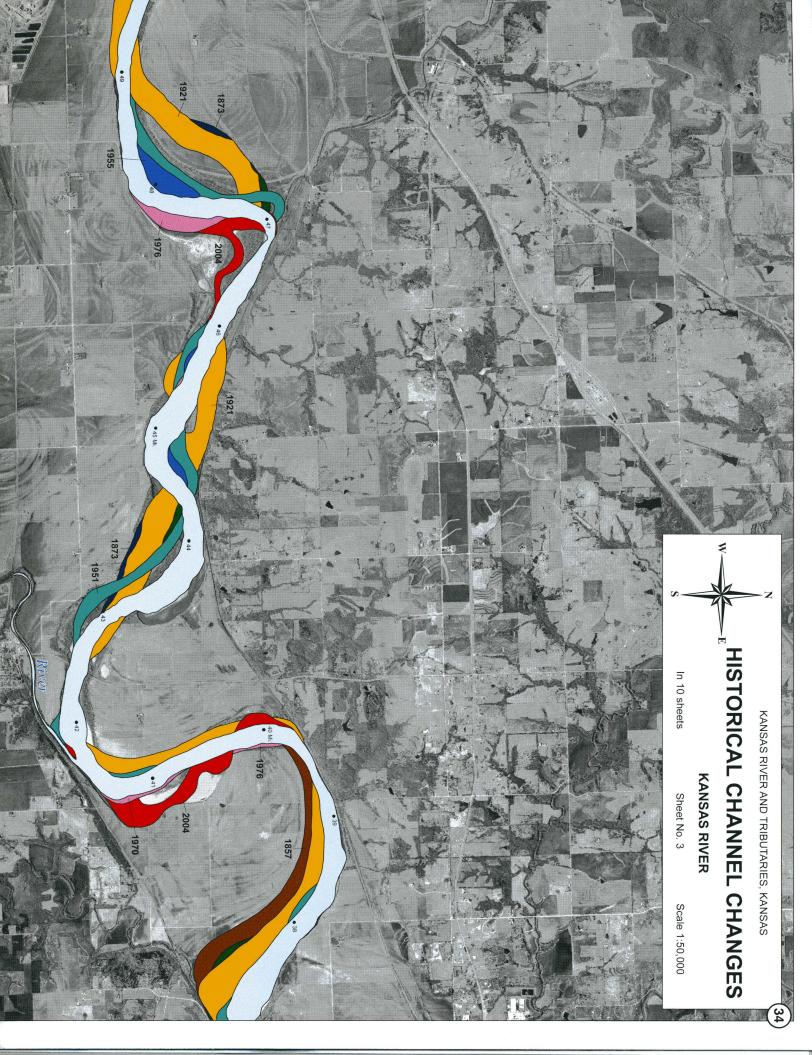
WAKEFIELD DORT, JR.



PECIAL PUBLICATION NUMBER 42

AMERICAN GEOGRAPHICAL SOCIETY





Sept. 9, 2012

Lawrence Douglas County Metropolitan Planning Office 6 East 6th Street, P.O. Box 708, Lawrence, KS 66044

Planning Staff:

As interested property owners, we are writing this letter to object to the Conditional Use Permit (CUP) that Penny Sand Co. has applied for near 1500N and 1850E. This CUP asks permission for a pit mining operation for sand removal. This would completely change the agricultural setting of the area. If allowed, this CUP would subject the area to dramatically increased industrial activity, including noise, dust, and environment destruction. We ask that you deny the CUP for the following reasons:

(1)The affected area has some interesting Douglas County history associated with it and contains some historic houses.

(2) The river bank in the vicinity of this proposed pit mining operation is unstable and has moved considerably over recent times. If pit mining is allowed in this area, in times of flood the chances of a dramatic river channel change is magnified greatly.

(3) On this proposed 434 acre pit mining site, the majority of the area is covered by some of the highest quality soils as defined by the US Department of Agriculture. It seems very short sighted to produce sand for short term gain and lose the potential for significant food and fiber production indefinitely.

(4)There is a large amount of overburden (unusable soil, silt and clay) that must be removed (typically 23-24 feet). Removing this much overburden will create an environmental nightmare

(5) Opening this pit operation will expose one of the most prolific aquifers in this region to potential pollution. This aquifer is a magnificent resource that must be protected and preserved for the future.

(6)Several neighboring house wells could be affected by this pit. Just down the valley about 1 5/8 miles lies the Eudora Public Water Supply Well Field; it could also be affected by the proposed pit mining operation.

Thank you for your consideration of our concerns.

Penny Sand Pit Petition

Name	Address	Phone Number	email	
Print: Carl Mc Elwee	1564 E. 1850 Rd.	785	Cmcelwee@Ku. Edy	
Signature: Carl M'Elure	Lowvence Vis 66046	843-4164		
Print: MARGERY MCELWEE	1564 E 1850 Rd	785		
signature: Margery McEluce	Lawrence KS 66046	843-4164		
Print: Rick Jauber	1555 E 1850 Rd			
Signature: Port Loculu	Lawrence FS	9028		
Print: Esther McCobrie	1455 E 1900 Rd	542	BMccabricola	1.0
Signature S. MIL Co alaria	Eudova HS 6602	2492		
Print: Robert MSCabrie	1455 E 1900 Rd	542	ti	
Signature: obut & Mc Cabrin	Eudore NS 66025	2492		
Print: Sth	1964 n) 155002	785	Scotinction	à
signature: Scott Jackson	Eudaz 66025	331	1964 (Dyahoo.c	om
Print: Bruce Perkins	Eudor 66025	000)	Bruce Perkins	-
Signature Rue Ru		7646295	Gmail. Con	
Print: Philip R Einst	826 May, Lawrence	843-2313		
Ernst		047		
Print: NORMAL. SCHMILLE	Illes & Glean Do			
		Q112-0013		
Signature: Norma L. Dehmill		-045-0745	AWDYKDE	
Print: AL & DEATHE	1918N 1500 RD	~10	SUN FLOWER = Com	
Signature: (1 W Scatto	EUDORA 185	542-2352		
Print: ViAnn K. Deathe	1918 N 1500-Rd			
signature: An A cathe	Endore KS 4605	542-235	2	

Penny Sand Pit Petition

Name	Address	Phone Number	email	
Print: Gregory Shipe	1394EROURS	785	Ks-wither Q	
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Print: Dr Karen Johnst-	1528 n 1500 Rd	785	dr Karenjohnsto-	
Signature: K. John	EU Jorz KS 6/02	52933	Egnaul. On	
Print: Inda Knabe	39460 W143rdST	785	Knabefarms@	
Signature: da thabe	Eudora, Ko 66025	542 2228	Wild blue. net	
Print: Richard Knabe	5ame			
signature: af Knahr		74		•
Print: PETER SHEWOUSA	1411 E. 1850 Road	3999	Rchenouda & hotm	lai
Signature:	haw rence, KS 6604	,		
Print: Building Blocks Daya	e 1411 E.1850 Road	785- 856-	buildingblocks	
Signature	hanvence, KS6604		Sunflower.Com	
Print: Stave BOYER	Euclora K.S.	285-218-		
signature: Store Boyer	2027 N ISOORD			
Print: Parey Jackson	(964 N 1550m Rd	785-331-	nancyjackson 46	
Signature: Certing Jath	Eudora, KS 66025	8743	gmail. Com	



The Master's Dredging Company, Inc.

Dredging Contractors P.O. Box 9, Lawrence, KS 66044 (913) 583-3335

September 12, 2012

Mr. Bruce Liese Chairman, Lawrence-Douglas County Planning Commission 6 East 6th Street Lawrence, Kansas 66044

Dear Mr. Liese,



We have a CUP for a sand plant operation approved in 1991 on land about 1.5 milesnortheast of the intersection of Noria Road and North 1500 Road. At the time of the 1991 approval of our CUP we had applied for both a Kansas River operation and a sand pit operation on the land where our sand plant was located. At the time, the zoning board did not feel that there was a need for both operations and gave me a choice between the two. I choose the river operation. Under a sand plant lease arrangement, Pennys Concrete has been producing sand from our river permit for over 17 years.

With a pending Corps of Engineer decision to halt both ours and Pennys' river permits, Pennys Concrete (1) terminated their lease agreement with us and (2) applied for zoning of an off-river sand pit operation. In light of this we are renewing our CUP zoning application for an off-river sand pit on land immediately adjacent to the Pennys Concrete's application for a CUP permit for off river sand pit operation. We are presently applying for a CUP for an off-river sand pit operation.

In light of the fact that Pennys Concrete and we have nearly identical CUP applications on adjacent lands, I would like to request that the zoning board defer consideration of Pennys Concrete's application and that the zoning board would consider both Pennys' and our CUP applications concurrently. I would appreciate your passing on this request to the rest of your zoning board, the planning staff, and county commissioners. If you have any questions, feel free to email me at (<u>davidpenny@theaquaticgroup.com</u>) or call me: 913-583-3335 (office, but please do not leave a message) or 785-218-8800 (cell, leave a message if you do not get me).

Sincerely,

David Penny President Lawrence Douglas County Metropolitan Planning Office 6 East 6th Street, P.O. Box 708, Lawrence, KS 66044

Planning Commission:

I would like to object to the request in David Penny's letter from The Masters Dredging Company, Inc. to defer consideration of the Penny Sand CUP from the Sept. 24 meeting. I and other land owners have worked to prepare for that meeting and would like to see our concerns addressed in a timely manner.

I have a long scheduled previous commitment Oct 15-25 and will be out of town. I ask the Planning Commission to please not schedule any meetings on this issue during my absence.

Thank you for your consideration. If I may answer any questions, please contact me.

Sincerely,

al M Slivee

Carl McElwee 1564 E. 1850 Rd. Lawrence, KS 66046 785-843-4164 cmcelwee@ku.edu



Traffic Impact Study

for

Penny Sand Plant Expansion

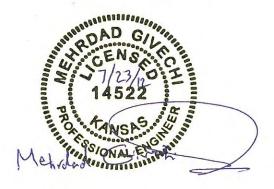
1-1/2 mile Northeast of the Intersection of Noria Road and N 1500 Road

Douglas County, Kansas

Prepared for Landplan Engineering, PA

> Prepared By





Mehrdad Givechi, PE, PTOE
July 2012

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Introduction

Proposed Development

The existing "Penny Sand Extraction" facility - located next to Kansas River approximately 1-1/2 miles northeast of the intersection of Noria Road (E 1750 Rd.) and N 1500 Road in Douglas County, Kansas – comprises approximately 114 acres. Under the proposed plan, the site will be expanded to include an additional sand excavation area of approximately 351 acres for a total site area of approximately 465 acres (See Location Map, Figure 1 of Appendix I). Access to the site, as shown on the Site Plan (Figure 2 of Appendix I), will remain unchanged at its current location at the intersection of Noria Road and N 1500 Road (i.e. north leg of the intersection).

The facility will be open for operation on weekdays and some Saturdays (approximately 250 days a year) between the hours of 6:30 a.m. and 6:30 p.m., staffed by as many as four (4) employees.

According to the Horizon 2020 (Map 4-2), the site is FEMA designated "Floodway" and "Floodway Fringe".

Existing Nearby Developments

Currently, the vast majority of the land in the proximity of the site is undeveloped with the exception of

- "East Hills Business Park" located on the west side of Noria Road approximately 2/3 miles south of N 1500 Road; and
- A few scattered residential dwelling units in the study area.

<u>Purpose</u>

The purpose of this study is to:

- 1. Evaluate the existing operating conditions of traffic along the anticipated route that site-generated trucks will utilize to access the site including the intersections of
 - a. Noria Road and N 1500 Road;
 - b. Noria Road and DG CO 442 (Old K-10);
 - c. DG CO 442 (Old K-10) and DG CO 1057 (E 1900 Rd); and

- d. The interchange of K-10 and DG CO 1057 (E 1900 Rd).
- 2. Assess impact of the trips generated by the proposed expansion of the sand facility on the above mentioned intersections and roadway network; and
- 3. Recommend off-site improvements needed (if any) as the result of this expansion.

Data Collection and Summary

In order to assess the impact of traffic generated by the expansion of the existing sand facility in the study area, field observations and traffic counts (including truck traffic) were conducted. The following paragraphs summarize the results of data collection efforts for this project.

Roadway Network Geometric & Operating Characteristics

In the vicinity of the development site, as illustrated in Figure 3 of Appendix I,

- N. 1500 Road is a two-way, two lane roadway that runs east/west approximately 1.4 miles south of the development site. This roadway extends west and becomes 15th Street at approximately 1-3/4 miles west of Noria Road as it enters the city limits of Lawrence. Some of the other roadway characteristics for N 1500 Road include:
 - Asphalt pavement with uneven surface west of E 1810 Road turning into gravel road east of there.
 - No shoulders.
 - An active railroad crossing (with gate and signal) approximately 1.3 miles west of Noria Road (just west of E 1625 Road).
 - Posted speed limit of 40 mph, changing to 30 mph west of E 1625 Road where railroad crossing is located.
 - Posted weight limit sign of "5 Tons" for commercial vehicles for both directions of travel.
 - East of Noria Road, it is designated as "Rural Minor Collector" on the County's T2030 Major Thoroughfare Map. This designation changes to "Minor Arterial" for the segment west of Noria Road.
 - West of Noria Road, it serves as a commuter route between Lawrence and both, Eudora and "East Hills Business Park".

- Noria Road (E. 1750 Road) is a two-way, two lane roadway that runs north/south along east side of "East Hills Business Park" connecting N 1500 Road to DG CO 442 (Old K-10) and K-10 Highway. Some of the other characteristics of this roadway include:
 - An active railroad crossing (with gate and signal) approximately 1/2 mile south of Noria Road.
 - Concrete pavement with 6' paved shoulders north of the railroad track.
 Asphalt pavement with 4' shoulders south of the railroad track.
 - Posted speed limit of 45 mph between Noria Road and DG CO 442 (old K-10), with an advisory speed limit sign of 35 mph along the curve south of DG CO 442.
 - Designated as "Minor Arterial" on the County's T2030 Major Thoroughfare Map.
 - It serves as a commuter route between Lawrence and both Eudora and "east Hills Business Park".
- DG CO 442 (Old K-10) is a two-way, two lane roadway that runs east/west approximately 1 mile south of Noria Road and goes through city of Eudora to the east. Other roadway characteristics include:
 - Asphalt pavement with uneven surface and unpaved 4'-6' shoulders.
 - Posted speed limit of 45 mph within the city limits (near Noria Road), changing to 55 mph in the county (west of Eudora).
 - Between Noria Road and Eudora, it is designated as "Minor Arterial" on the County's T2030 Major Thoroughfare Map.
 - West of Eudora, this roadway serves as a commuter route between Eudora and both, Lawrence and "East Hills Business Park".
- DG CO 1057 is a two-way, two lane roadway running north/south crossing DG CO 442 at approximately 1.5 miles east of Noria Road providing a main connection to K-10 Highway. Other roadway characteristics include:
 - Asphalt pavement with unpaved 2'-4' shoulders.
 - Posted speed limit of 45 mph.
 - Designated as "Minor Arterial" on the County's T2030 Major Thoroughfare Map.

- All intersections in the study area have one lane on each approach except for the:
 - Intersection of DG CO 1057 and DG CO 442, which has a dedicated northbound right-turn lane with approximately 175' of storage and a dedicated westbound left-turn lane with approximately 110' of storage; and
 - Intersection of Noria Road and DG CO 442, which has a dedicated westbound right-turn lane with 175' of storage; and a channelized northbound right turnout.

Manual Traffic Counts

Currently, the "East Hills Business Park" is the main trip generator in the study area and will most likely dictate the time periods during which traffic on the adjacent roadway network reaches its peak. As part of this study, therefore, vehicular turning movement counts (including truck traffic) were conducted at the intersections under study during the time periods when shift changes for the "East Hills Business Park" occur.

Currently the shifts change at 6:30, 7:00 and 7:30 in the morning and 2:30, 3:00 and 3:30 in the afternoon. Therefore, for the purpose of this analysis, turning movement counts were conducted from 6:00 to 9:00 a.m. and 2:00 to 5:00 p.m. on typical weekdays (July 11th, 12th and 17th, 2012). The results, as summarized in Appendix III and illustrated in Figures 4 and 5 of Appendix I, indicate that

- Morning peak occurs between 7:30 and 8:30 a.m. for all vehicles including truck traffic; and
- Afternoon peak occurs between 4:00 and 5:00 p.m. for all vehicles, and between 3:00 and 4:00 p.m. for truck traffic.
- At the intersection of Noria Road and N 1500 Road, the predominant movements are eastbound right-turn and northbound left-turn with no truck traffic on N 1500 Road.
- At the intersection of Noria Road and DG CO 442, the predominant movements are southbound left-turn and westbound right-turn. The predominant truck movements,

however, are northbound through (31% to 46%) and southbound left-turn (7% to 16%).

- At the intersection of DG CO 442 and DG CO 1057, the predominant movements are eastbound and westbound through. The predominant truck movements, however, are eastbound right-turn (19% to 31%) and northbound right-turn (unusually high at 27% to 60%).
- At the interchange of K-10 and DG CO 1057, the predominant movements are southbound right-turn (at the north ramps) and eastbound left-turn (at the south ramps). The predominant truck movements, however, are southbound left-turn (20% to 32%) and eastbound left-turn (unusually high at 25% to 34%), both at the south ramps.
- Field observations indicate that loaded trucks, leaving the existing sand plant, take Noria Road south to DG CO 442 (Old K-10), then east to DG CO 1057, then south to K-10 interchange, then east to their destinations. After their delivery, the trucks head back to the sand plant using K-10 Highway, then north on Noria Road straight to the plant entrance off of N 1500 Road.

NOTES:

- 1. During the time period traffic counts were being conducted for this study, there was a paving project near Eudora that generated a large number of truck traffic. Loaded trucks, carrying asphalt material, got to the job site from west using K-10 Highway to access DG CO 1057 at the interchange, then head north to DG CO 442 (Old K-10), then east to Eudora. Empty trucks left the job site using Church Street south to K-10 Highway, then west to the asphalt plant. This construction activity resulted in an skew in the normal truck traffic pattern in the study area, which caused the heavy truck movement for the eastbound left-turn movement at the interchange and northbound right-turn movement at the intersection of DG Co 1057 and DG CO 442.
- <u>DG CO 1057, approximately ½ mile south of the K-10 interchange, has been closed</u> to traffic for a bridge replacement project. This also affected the through traffic on <u>DG CO 1057 south of the interchange.</u>

Evaluation of the Existing Operating Conditions

A volume/capacity analysis (using methodologies outlined in the <u>2000 Highway Capacity</u> <u>Manual (HCM) published by the Transportation Research Board</u>) was conducted to determine the level-of-service (LOS) for all movements at the intersections under study during the afternoon peak-hour of a typical weekday.

Level-of-service, as defined in the HCM, describes the quality of traffic operating condition and ranges from "A" to "F", with LOS "A" representing the best (most desirable with minimum delay) conditions and LOS "F" the worst (severely congested with excessive delays). The following chart outlines the level-of-service criteria for unsignalized and signalized intersections.

	Control Delay for	Control Delay for
Level-Of-Service	Unsignalized Intersections	Signalized Intersections
	(seconds/vehicle)	(seconds/vehicle)
A	0 – 10	0 – 10
В	> 10 – 15	> 10 – 20
С	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F	> 50	> 80

The results of analysis, as shown in Appendix II and summarized in Figure 6 of Appendix I, indicate that, under the existing conditions, all movements at all intersections in the study area operate at LOS "B" or higher during both morning and afternoon peak-hours of a typical weekday.

Trip Generation Analysis

Typically, trips generated by a proposed development are estimated using trip generation rates suggested by the *Institute of Transportation Engineers, Trip Generation Manual, 8th* <u>*Edition.*</u> Since the Manual does not have information for land use type "Sand Plant", the following procedure was used for analysis:

- For the sand processing component of this development, the number of trucks generated by this site was estimated based on the following assumptions:
 - With the proposed new expansion, the plant is anticipated to distribute as much as 5,000 tons of sand on a most productive day.
 - 80% of trucks serving the site will be Tractor Trailers each with a maximum load capacity of 25-30 tons. The remaining 20% will be tandem trucks each hauling between 15 and 18 tons. This is equivalent to an average truck load of approximately 25 tons.
 - Assuming a high productive day (5,000 tons of distribution), the estimated number of trucks serving the site will be around 200 trucks/day, which equates to a total of 400 trip-ends (two-way trips) per day.
 - Hauling time varies for different plants. Truckers going to the same plant have different lap times. The only time that trucks tend to arrive somewhat simultaneously is first thing in the morning when a plant opens. Their departure from the plant, however, is not simultaneous due to individual loading times. Other times throughout the day, truck traffic to/from the plant is spread out randomly over the 12-hours of operation (6:30 a.m. to 6:30 p.m.). For analysis purposes, it is assumed that peakhour truck traffic will be approximately 12% of the daily truck traffic, which is approximately 48 trip-ends (24 inbound and 24 outbound) during the morning peak-hour of operation.
 - To account for the existing traffic in/out of the site (i.e. current operation of the sand plant), a truck count survey was conducted during the time period when turning movement counts were being conducted. The results, as summarized in Figure 5 of Appendix I, indicate that the existing sand processing facility generates 8 trip-ends (4 inbound and 4 outbound)

during the morning peak-hour, and 9 trip-ends (5 inbound and 4 outbound) during the afternoon peak-hour.

• For the office component of this development, no increase in number of employees are anticipated, hence no additional trips will be generated by the office component.

Using above mentioned assumptions, the <u>net increase</u> in number of trips resulted by the proposed sand plant expansion will be approximately 40 trip-ends (20 inbound and 20 outbound) during both morning and afternoon peak-hours of a typical weekday - all truck traffic.

Analysis Time Period

An overview of the existing traffic volumes in the study area and their peak characteristics, in conjunction with estimated trips generated from the proposed development, indicate that the most critical peak period will likely occur during <u>morning peak-hour</u> of a typical weekday. Therefore, the morning peak-hour is selected as the analysis time period for this study. In addition, afternoon peak-hour is also analyzed.

Trip Distribution and Assignment Analysis

As mentioned earlier, field observations indicate that all truck traffic generated by the existing sand operation head south on Noria Road, thence east on DG CO 442, thence south on DG CO 1057 to access K-10 Highway and head east. Based on the information provided by the applicant, the vast majority of the new trips generated by the site expansion will also follow the same patterns. Figures 7 and 8 of Appendix I illustrate trip distribution patterns and assignment for the site-generated trips, respectively. Note that a small portion of the trips (~ 5%) are assigned to go west on K-10 (at the interchange) to represent occasional trips to the west.

Impact Assessment

Volume/Capacity Analysis

An evaluation of the "Existing + Proposed Development" traffic conditions (using HCS2000 methodology mentioned earlier) indicates that LOS for all movements at all intersections under study remain unchanged at "B" or higher during both morning and afternoon peakhours of a typical weekday. The results, as shown in Appendix II and illustrated in Figures 9 and 10 of Appendix I, indicate that traffic generated from the proposed facility expansion will not have a negative impact on the capacity of the roadway networks in the study area.

Dedicated Turn-Lane Analysis

Using the guidelines for both right-turn and left-turn treatments at unsignalized intersections (as listed in Appendix IV) indicate that, from traffic volume stand point, no new dedicated turn lanes are required at any intersections in the study area.

Under the existing conditions, during the critical analysis period (morning peak-hour of a typical weekday), approximately 17% of the eastbound traffic at the intersection of DG CO 442 and DG CO 1057 consists of heavy trucks - all of which negotiate right turn at this location. The proposed expansion for the sand plant will significantly increase the heavy truck traffic for this movement to as high as ~42% of the total eastbound movement. Because of their low power/acceleration ratio, not having a dedicated eastbound right-turn lane may interfere with the through traffic creating a safety concern. It is, therefore, desirable (as a safety measure) that a dedicated eastbound right-turn lane be provided at this location to keep the large number of heavy trucks out of the main traffic flow on DG CO 442.

Summary & Recommendations

The results of this impact analysis indicate that the proposed "Penny Sand Plant Expansion" will have minimal impact on the capacity of the roadway network in the study area with no degradation of level-of-service at any locations under study (LOS of "B" or higher).

From safety stand point, however, the following improvements are desirable:

- 1. Pave a 100' long section of the site access, just north of N 1500 Road, to keep gravel from being tracked, by site-generated trucks, onto the intersection.
- 2. Provide a dedicated eastbound right-turn lane on DG CO 442 (Old K-10) at its intersection with DG CO 1057 (E 1900 Rd). The minimum storage length for this turn lane should be 150' in order to accommodate two (2) tractor trailer and two passenger cars. This is a desirable safety measure to keep loaded heavy trucks (having low power/acceleration ratio) out of the main traffic flow. Under the existing conditions, there is a 12' wide paved area for a length of approximately 140' that is not marked as a traffic lane rather has white crosshatch pavement marking along its entire length. This area can potentially be utilized to create the subject right-turn lane.
- 3. Pavement condition along certain segments of the roadway network in the study area should be evaluated to determine if it can withstand the increase in heavy truck traffic resulted by the proposed sand plant expansion.

APPENDIX I

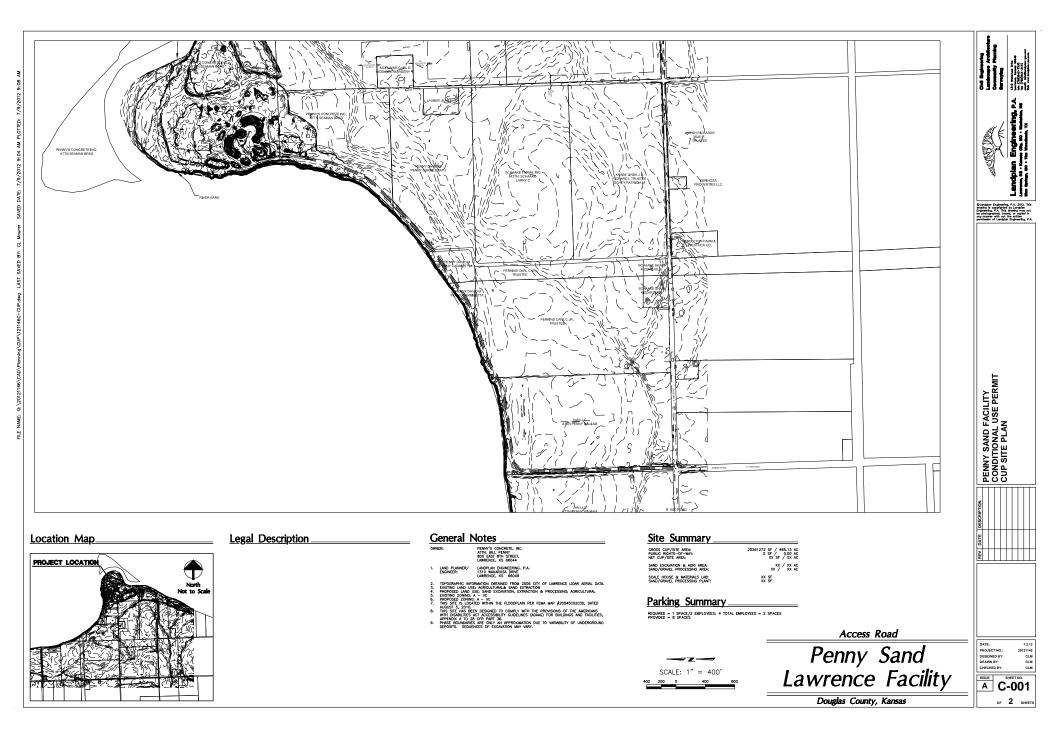
Results of Trip Distribution and Assignment Analysis

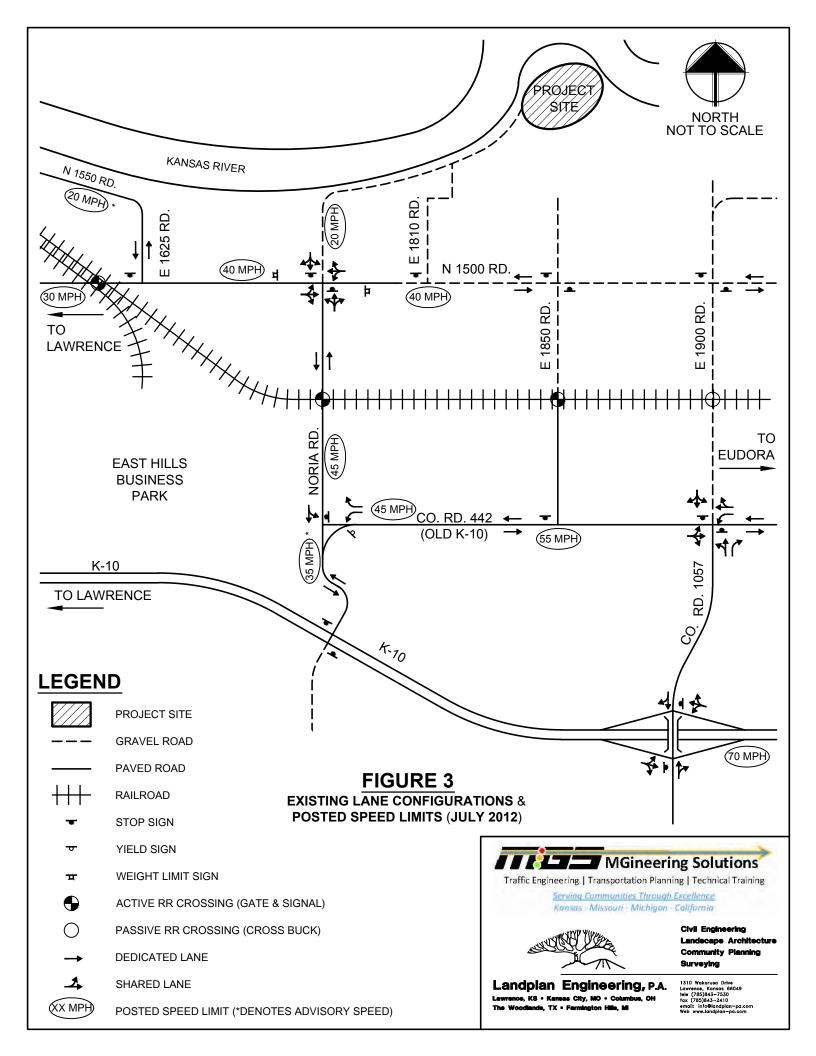


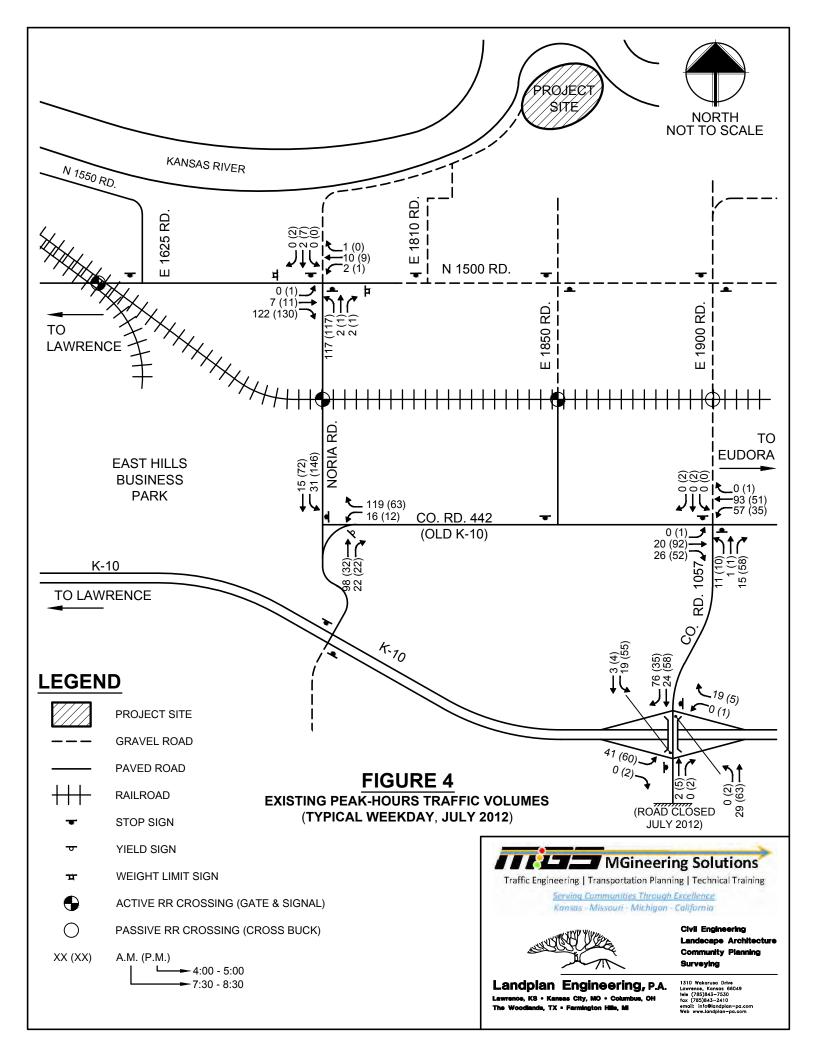
Intersections under study

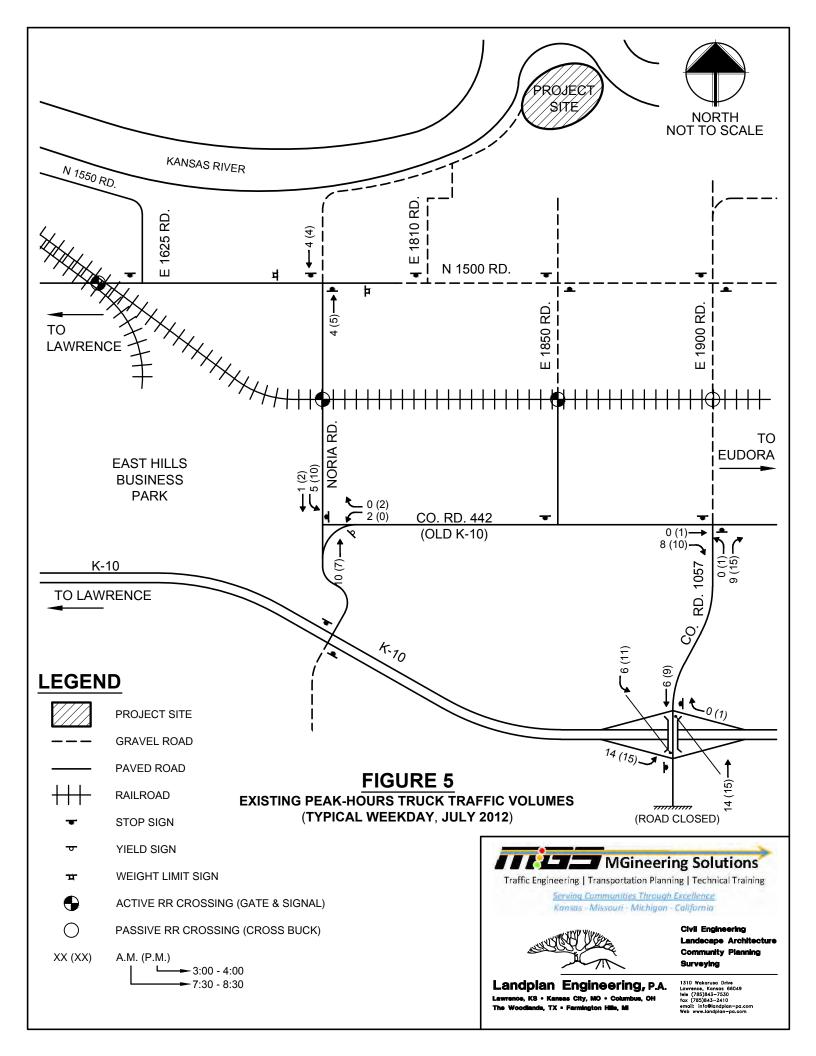
Figure 1

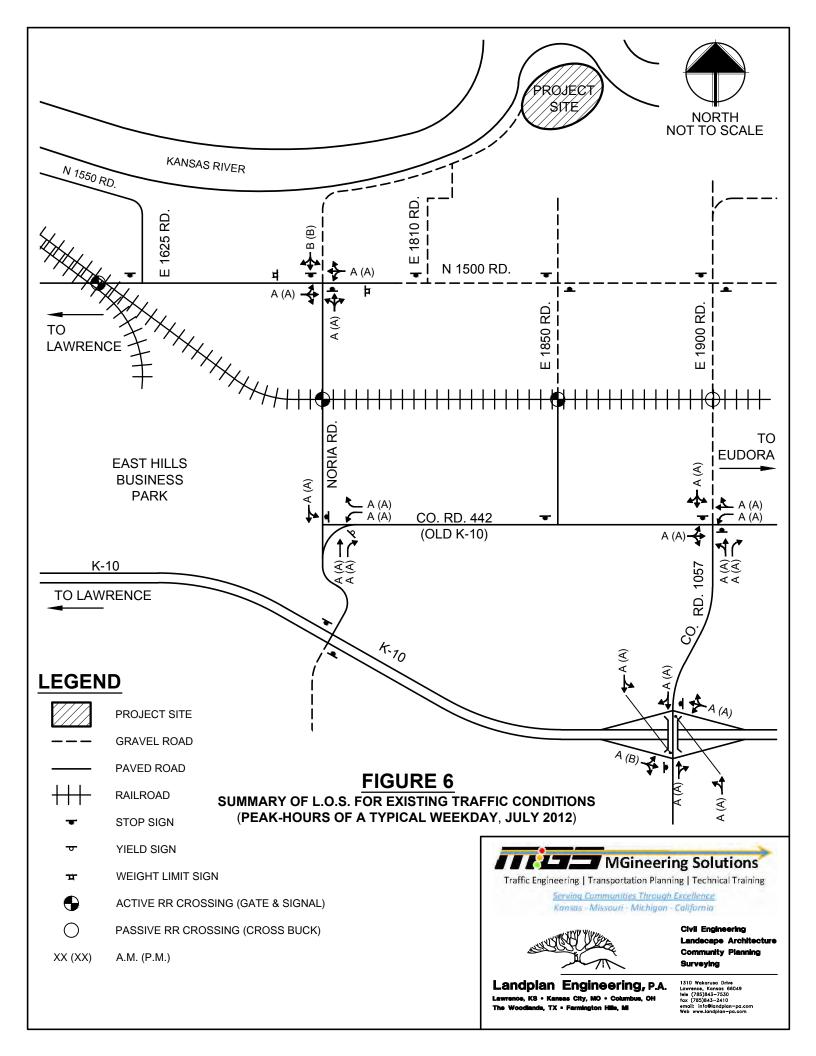
Location Map

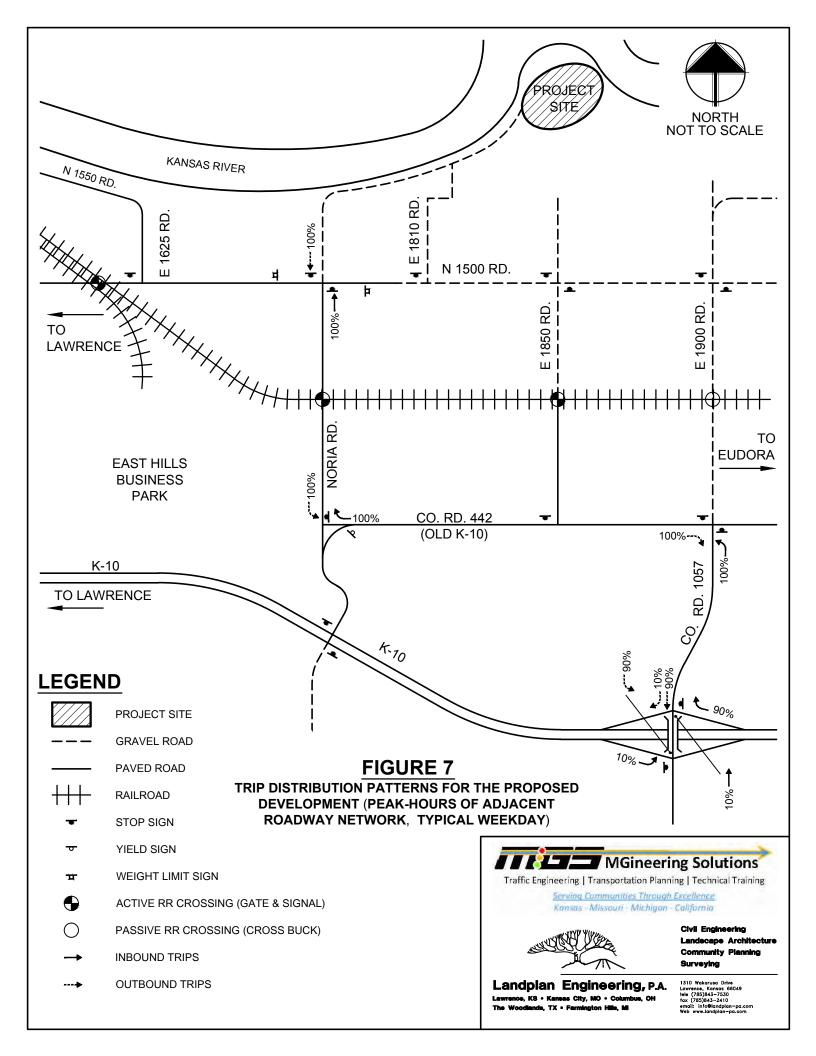


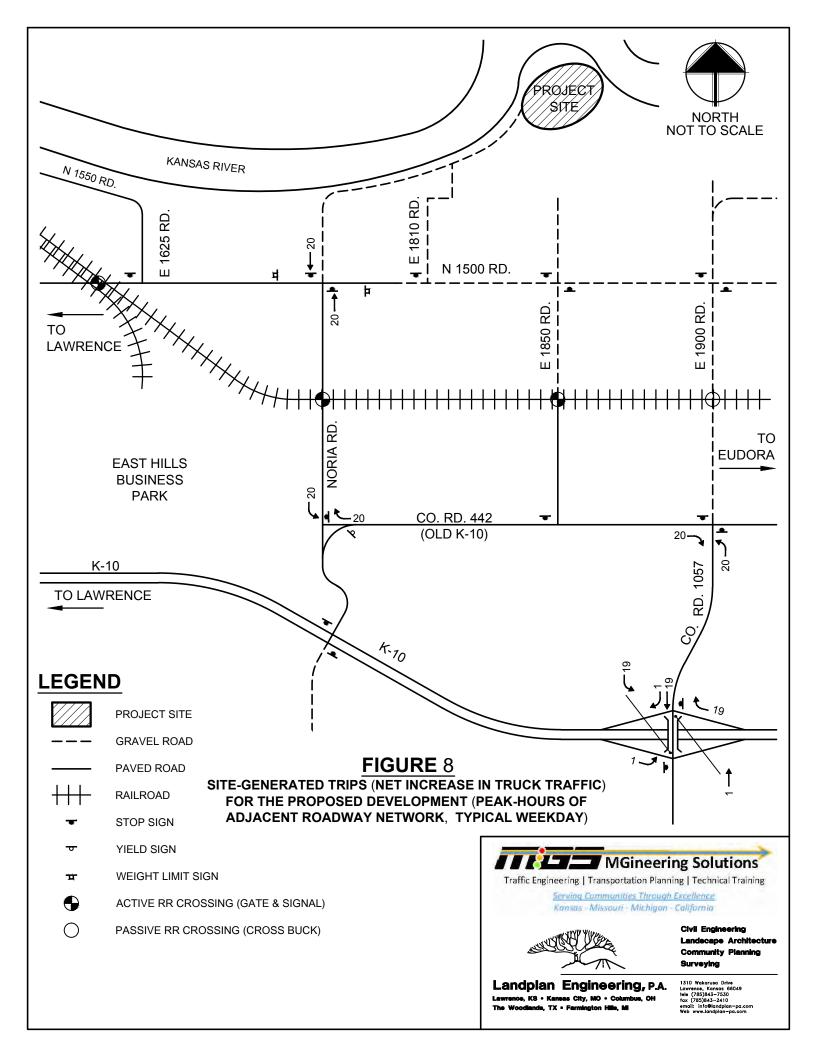


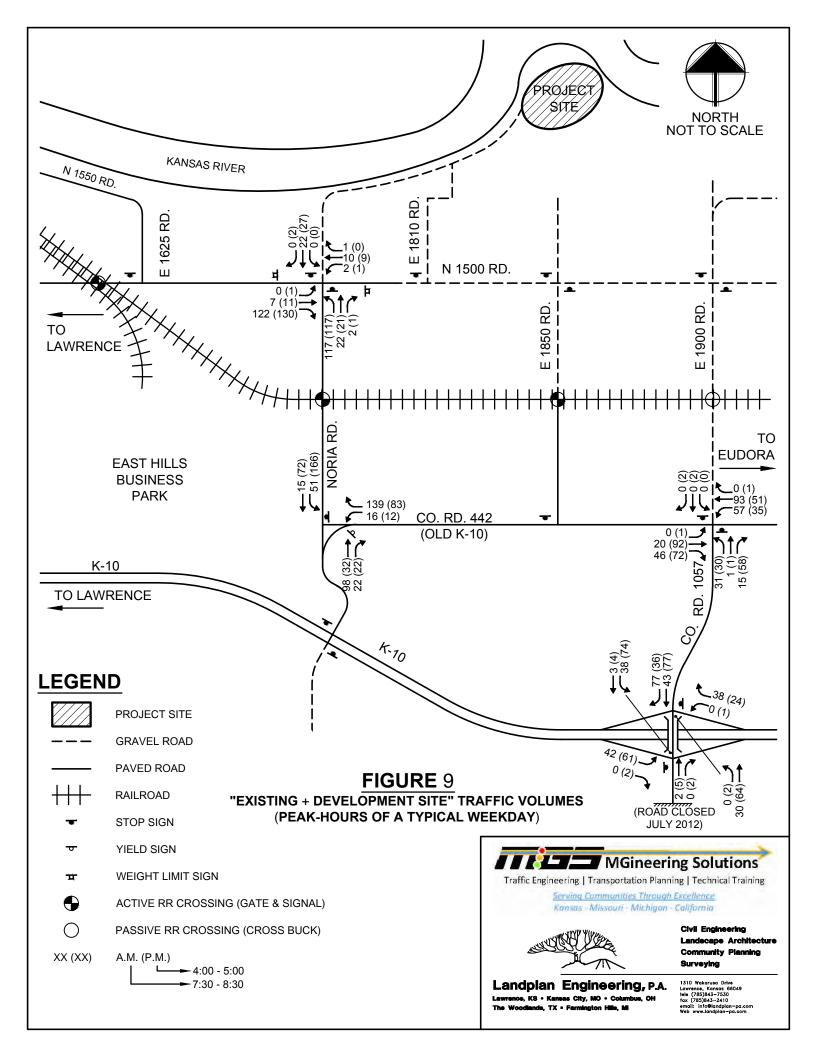


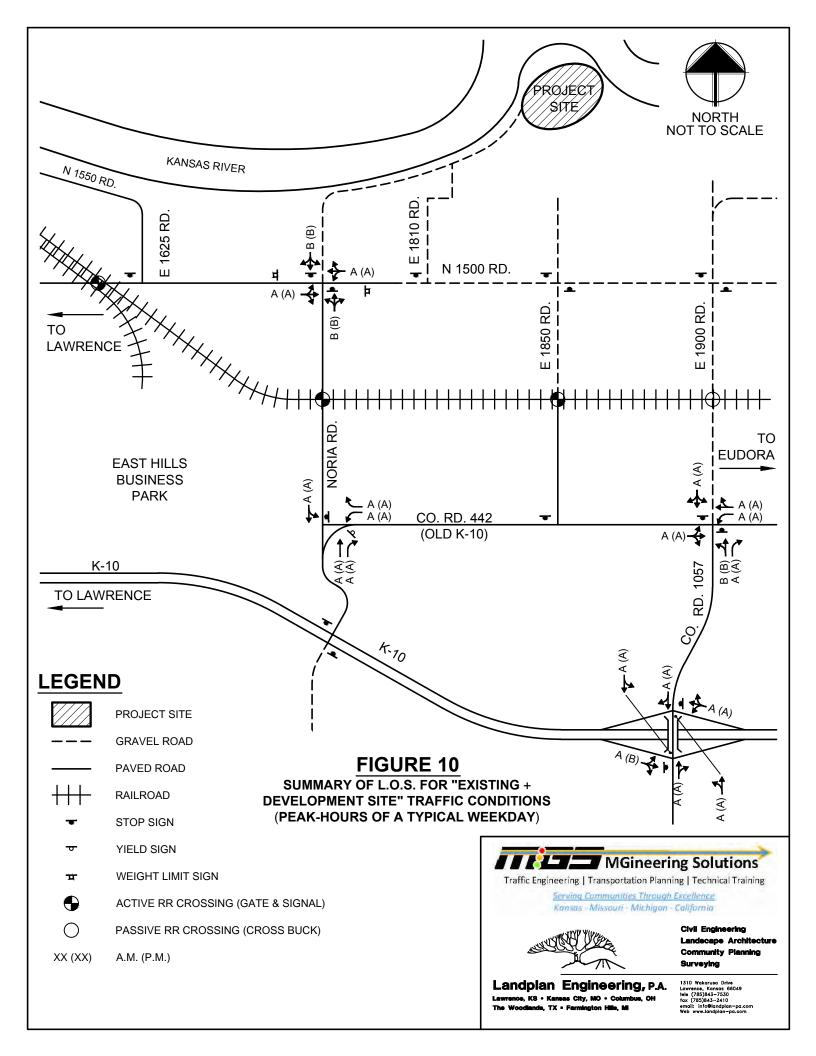












APPENDIX II

Results of Highway Capacity Analysis

Using Synchro 7 Software

EXISTING CONDITIONS

Intersection of N 1500 Rd & Noria Rd

						-					5						
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR					
Lane Configurations		\$			\$			\$			\$						
Volume (veh/h)	0	7	122	2	10	1	117	2	2	0	2	0					
Sign Control		Free			Free			Stop			Stop						
Grade		0%			0%			0%			0%						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph)	0	8	133	2	11	1	127	2	2	0	2	0					
Pedestrians																	
Lane Width (ft)																	
Walking Speed (ft/s)																	
Percent Blockage																	
Right turn flare (veh)																	
Median type		None			None												
Median storage veh)																	
Upstream signal (ft)																	
pX, platoon unblocked																	
vC, conflicting volume	12			140			91	90	74	93	156	11					
vC1, stage 1 conf vol																	
vC2, stage 2 conf vol																	
vCu, unblocked vol	12			140			91	90	74	93	156	11					
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	7.5	6.2					
tC, 2 stage (s)																	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.9	3.3					
p0 queue free %	100			100			86	100	100	100	100	100					
cM capacity (veh/h)	1607			1443			890	799	988	886	588	1069					
Direction, Lane #	EB 1	WB 1	NB 1	SB 1													
Volume Total	140	14	132	2													
Volume Left	0	2	127	0													
Volume Right	133	1	2	0													
cSH	1607	1443	890	588													
Volume to Capacity	0.00	0.00	0.15	0.00													
Queue Length 95th (ft)	0	0	13	0													
Control Delay (s)	0.0	1.2	9.7	11.1													
Lane LOS		А	А	В													
Approach Delay (s)	0.0	1.2	9.7	11.1													
Approach LOS			А	В													
Intersection Summary																	
Average Delay			4.6														
Intersection Capacity Utiliza	ation		28.0%	IC	CU Level	of Service			А								
Analysis Period (min)			15														

Intersection of N 1500 Rd & Noria Rd

	≯	+	*	4	Ļ	•	•	t	*	1	Ļ	~			
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations		\$			\$			\$			\$				
Volume (vph)	1	11	130	1	9	0	117	1	1	0	7	2			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Frt		0.876						0.999			0.973				
Flt Protected					0.995			0.953							
Satd. Flow (prot)	0	1632	0	0	1853	0	0	1760	0	0	1025	0			
Flt Permitted					0.995			0.953							
Satd. Flow (perm)	0	1632	0	0	1853	0	0	1760	0	0	1025	0			
Link Speed (mph)		30			30			30			30				
Link Distance (ft)		742			793			5163			445				
Travel Time (s)		16.9			18.0			117.3			10.1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	100%	2%	2%	100%	2%			
Adj. Flow (vph)	1	12	141	1	10	0	127	1	1	0	8	2			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	154	0	0	11	0	0	129	0	0	10	0			
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No			
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right			
Median Width(ft)		0			0			0			0				
Link Offset(ft)		0			0			0			0				
Crosswalk Width(ft)		16			16			16			16				
Two way Left Turn Lane															
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Turning Speed (mph)	15		9	15		9	15		9	15		9			
Sign Control		Free			Free			Stop			Stop				
Intersection Summary															
Area Type: C	Other														
Control Type: Unsignalized															
	00.00/			10		(A									

Intersection Capacity Utilization 28.8% Analysis Period (min) 15

ICU Level of Service A

	4	•	Ť	1	1	Ļ
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	ሻ	1	1	1		र्स
Volume (veh/h)	16	119	98	22	31	15
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	129	107	24	34	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		7				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	190	107			107	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	190	107			107	
tC, single (s)	6.5	6.2			4.3	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.3	
p0 queue free %	98	86			98	
cM capacity (veh/h)	758	948			1401	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	147	107	24	50		
Volume Left	17	0	0	34		
Volume Right	129	0	24	0		
cSH	1075	1700	1700	1401		
Volume to Capacity	0.14	0.06	0.01	0.02		
Queue Length 95th (ft)	12	0	0	2		
Control Delay (s)	9.5	0.0	0.0	5.2		
Lane LOS	А			А		
Approach Delay (s)	9.5	0.0		5.2		
Approach LOS	А					
Intersection Summary						
Average Delay			5.0			
Intersection Capacity Utiliza	ation		19.2%	IC	U Level o	of Service
Analysis Period (min)			15			
J						

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Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations	۲	1	†	1		र्स		
Volume (veh/h)	12	63	32	22	146	72		
Sign Control	Stop		Free			Free		
Grade	0%		0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	13	68	35	24	159	78		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)		7						
Median type			None			None		
Median storage veh)								
Upstream signal (ft)								
pX, platoon unblocked								
vC, conflicting volume	430	35			35			
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	430	35			35			
tC, single (s)	6.4	6.5			4.2			
tC, 2 stage (s)								
tF (s)	3.5	3.6			2.3			
p0 queue free %	98	93			90			
cM capacity (veh/h)	522	959			1545			
Direction, Lane #	WB 1	NB 1	NB 2	SB 1				
Volume Total	82	35	24	237				
Volume Left	13	0	0	159				
Volume Right	68	0	24	0				
cSH	1141	1700	1700	1545				
Volume to Capacity	0.07	0.02	0.01	0.10				
Queue Length 95th (ft)	6	0	0	9				
Control Delay (s)	9.5	0.0	0.0	5.4				
Lane LOS	А			А				
Approach Delay (s)	9.5	0.0		5.4				
Approach LOS	А							
Intersection Summary								
Average Delay			5.4					
Intersection Capacity Utiliz	ation		28.5%	IC	U Level o	of Service		
Analysis Period (min)			15					
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Intersection of DG CO 442 & DG CO 1057

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$		٦	el 🗧			र्भ	1		\$	
Volume (veh/h)	0	20	26	57	93	0	11	1	15	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	28	62	101	0	12	1	16	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									7			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	101			50			261	261	36	270	275	101
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	101			50			261	261	36	270	275	101
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			96			98	100	98	100	100	100
cM capacity (veh/h)	1491			1557			671	618	1025	651	607	954
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	50	62	101	29	0							
Volume Left	0	62	0	12	0							
Volume Right	28	0	0	16	0							
cSH	1491	1557	1700	1500	1700							
Volume to Capacity	0.00	0.04	0.06	0.02	0.00							
Queue Length 95th (ft)	0	3	0	1	0							
Control Delay (s)	0.0	7.4	0.0	9.4	0.0							
Lane LOS		А		А	А							
Approach Delay (s)	0.0	2.8		9.4	0.0							
Approach LOS				А	А							
Intersection Summary												
Average Delay			3.0									
Intersection Capacity Utiliza	ation		19.8%	IC	CU Level o	of Service			А			
Analysis Period (min)			15									

Intersection of DG CO 442 & DG CO 1057

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$		ľ	el el			ę	1		\$	
Volume (veh/h)	1	92	52	35	51	1	10	1	58	0	2	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	100	57	38	55	1	11	1	63	0	2	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									7			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	57			157			265	263	128	295	291	56
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	57			157			265	263	128	295	291	56
tC, single (s)	4.1			4.1			7.2	6.5	6.5	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			97			98	100	93	100	100	100
cM capacity (veh/h)	1548			1423			654	624	861	596	603	1011
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	158	38	57	75	4							
Volume Left	1	38	0	11	0							
Volume Right	57	0	1	63	2							
cSH	1548	1423	1700	1025	755							
Volume to Capacity	0.00	0.03	0.03	0.07	0.01							
Queue Length 95th (ft)	0	2	0	6	0							
Control Delay (s)	0.1	7.6	0.0	9.7	9.8							
Lane LOS	А	А		А	А							
Approach Delay (s)	0.1	3.1		9.7	9.8							
Approach LOS				А	А							
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utiliza	ition		28.7%	IC	CU Level o	of Service			А			
Analysis Period (min)			15									

K-10 & DG CO 1057 (North Ramps)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					\$			با			eî	
Volume (veh/h)	0	0	0	0	0	19	0	29	0	0	24	76
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	21	0	32	0	0	26	83
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	120	99	67	99	140	32	109			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	120	99	67	99	140	32	109			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	98	100			100		
cM capacity (veh/h)	839	791	996	883	751	1042	1482			1581		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	21	32	109									
Volume Left	0	0	0									
Volume Right	21	0	83									
cSH	1042	1482	1700									
Volume to Capacity	0.02	0.00	0.06									
Queue Length 95th (ft)	2	0	0									
Control Delay (s)	8.5	0.0	0.0									
Lane LOS	А											
Approach Delay (s)	8.5	0.0	0.0									
Approach LOS	А											
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization	ation		15.9%	IC	CU Level	of Service			А			
Analysis Period (min)			15									
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K-10 & DG CO 1057 (North Ramps)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					\$			र्भ			ef 🔰	
Volume (veh/h)	0	0	0	1	0	5	2	63	0	0	58	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1	0	5	2	68	0	0	63	38
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	160	155	82	155	174	68	101			68		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	160	155	82	155	174	68	101			68		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.5	2.2			2.2		
p0 queue free %	100	100	100	100	100	99	100			100		
cM capacity (veh/h)	800	736	978	811	718	947	1491			1533		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	7	71	101									
Volume Left	1	2	0									
Volume Right	5	0	38									
cSH	921	1491	1700									
Volume to Capacity	0.01	0.00	0.06									
Queue Length 95th (ft)	1	0	0									
Control Delay (s)	8.9	0.2	0.0									
Lane LOS	А	А										
Approach Delay (s)	8.9	0.2	0.0									
Approach LOS	А											
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization	ation		15.2%	IC	CU Level of	of Service			А			
Analysis Period (min)			15									

K-10 & DG CO 1057 (South Ramps)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$						et 🗧			ب ا	
Volume (veh/h)	41	0	0	0	0	0	0	2	0	19	3	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	0	0	0	0	0	0	2	0	21	3	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	47	47	3	47	47	2	3			2		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	47	47	3	47	47	2	3			2		
tC, single (s)	7.4	6.5	6.2	7.1	6.5	6.2	4.1			4.4		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.3	3.5	4.0	3.3	2.2			2.5		
p0 queue free %	95	100	100	100	100	100	100			99		
cM capacity (veh/h)	871	833	1081	944	833	1082	1619			1444		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	45	2	24									
Volume Left	45	0	21									
Volume Right	0	0	0									
cSH	871	1700	1444									
Volume to Capacity	0.05	0.00	0.01									
Queue Length 95th (ft)	4	0.00	1									
Control Delay (s)	9.4	0.0	6.5									
Lane LOS	A	0.0	A									
Approach Delay (s)	9.4	0.0	6.5									
Approach LOS	A	0.0	0.0									
Intersection Summary												
Average Delay			8.1									
Intersection Capacity Utiliza	ation		17.9%	IC	CU Level (of Service			А			
Analysis Period (min)			15		5 20001							
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K-10 & DG CO 1057 (South Ramps)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$						et			ŧ	
Volume (veh/h)	60	0	2	0	0	0	0	5	2	55	4	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	0	2	0	0	0	0	5	2	60	4	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	130	132	4	133	130	7	4			8		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	130	132	4	133	130	7	4			8		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2			2.4		
p0 queue free %	92	100	100	100	100	100	100			96		
cM capacity (veh/h)	768	729	1079	812	730	1076	1617			1503		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	67	8	64									
Volume Left	65	0	60									
Volume Right	2	2	0									
cSH	775	1700	1503									
Volume to Capacity	0.09	0.00	0.04									
Queue Length 95th (ft)	7	0	3									
Control Delay (s)	10.1	0.0	7.0									
Lane LOS	В		А									
Approach Delay (s)	10.1	0.0	7.0									
Approach LOS	В											
Intersection Summary												
Average Delay			8.1									
Intersection Capacity Utiliza	ation		20.0%	IC	CU Level of	of Service			А			
Analysis Period (min)			15									

EXISTING + DEVELOPMENT TRAFFIC CONDITIONS

Intersection of N 1500 Rd & Noria Rd

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4			4	
Volume (veh/h)	0	7	122	2	10	1	117	22	2	0	22	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	8	133	2	11	1	127	24	2	0	24	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	12			140			102	90	74	104	156	11
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	12			140			102	90	74	104	156	11
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	7.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.9	3.3
p0 queue free %	100			100			85	97	100	100	96	100
cM capacity (veh/h)	1607			1443			851	799	988	853	588	1069
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	140	14	153	24								
Volume Left	0	2	103	24								
Volume Right	133	1	2	0								
cSH	1607	1443	844	588								
Volume to Capacity	0.00	0.00	0.18	0.04								
Queue Length 95th (ft)	0.00	0.00	17	0.04								
Control Delay (s)	0.0	1.2	10.2	11.4								
Lane LOS	0.0	A	10.2 B	B								
Approach Delay (s)	0.0	1.2	10.2	11.4								
Approach LOS	0.0	1.2	B	B								
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utiliza	ition		29.0%	IC	CU Level o	f Service			А			
Analysis Period (min)			15									
			10									

Intersection of N 1500 Rd & Noria Rd

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$			4			\$	
Volume (veh/h)	1	11	130	1	9	0	117	21	1	0	27	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	12	141	1	10	0	127	23	1	0	29	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	10			153			114	97	83	109	167	10
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	10			153			114	97	83	109	167	10
tC, single (s)	4.1			4.1			7.1	7.5	6.2	7.1	7.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.9	3.3	3.5	4.9	3.3
p0 queue free %	100			100			85	96	100	100	95	100
cM capacity (veh/h)	1610			1427			828	640	977	844	579	1072
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	154	11	151	32								
Volume Left	1	1	127	0								
Volume Right	141	0	1	2								
cSH	1610	1427	793	598								
Volume to Capacity	0.00	0.00	0.19	0.05								
Queue Length 95th (ft)	0	0	17	4								
Control Delay (s)	0.1	0.8	10.6	11.4								
Lane LOS	А	А	В	В								
Approach Delay (s)	0.1	0.8	10.6	11.4								
Approach LOS			В	В								
Intersection Summary												
Average Delay			5.7									
Intersection Capacity Utiliza	ation		29.8%	IC	CU Level o	of Service			А			
Analysis Period (min)			15									

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	<u> </u>	1	<u>†</u>	1		र्स	
Volume (veh/h)	16	139	98	22	51	15	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	17	151	107	24	55	16	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)		7					
Median type			None			None	
Median storage veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	234	107			107		
vC1, stage 1 conf vol	201	101			107		
vC2, stage 2 conf vol							
vCu, unblocked vol	234	107			107		
tC, single (s)	6.5	6.2			4.3		
tC, 2 stage (s)	0.0	0.2			ч.5		
tF (s)	3.6	3.3			2.3		
p0 queue free %	3.0 98	3.3 84			2.3 96		
	98 704	948			90 1401		
cM capacity (veh/h)					1401		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1			
Volume Total	168	107	24	72			
Volume Left	17	0	0	55			
Volume Right	151	0	24	0			
cSH	1057	1700	1700	1401			
Volume to Capacity	0.16	0.06	0.01	0.04			
Queue Length 95th (ft)	14	0	0	3			
Control Delay (s)	9.6	0.0	0.0	6.0			
Lane LOS	А			А			
Approach Delay (s)	9.6	0.0		6.0			
Approach LOS	A						
Intersection Summary							
Average Delay			5.5				
Intersection Capacity Utiliza	ation		20.4%	IC	U Level o	f Service	
Analysis Period (min)			15				
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Intersection of Noria Rd & DG CO 442

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	٦	1	↑	1		र्भ
Volume (veh/h)	12	83	32	22	166	72
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	90	35	24	180	78
Pedestrians	10	70	00	21	100	10
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		7				
Median type		,	None			None
Median storage veh)			NONC			NUNC
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	474	35			35	
vC1, stage 1 conf vol	+/+	- 35			55	
vC2, stage 2 conf vol						
vCu, unblocked vol	474	35			35	
tC, single (s)	6.4	6.5			4.2	
tC, 2 stage (s)	0.1	0.5			7.2	
tF (s)	3.5	3.6			2.3	
p0 queue free %	97	91			88	
cM capacity (veh/h)	485	959			1545	
					1343	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	103	35	24	259		
Volume Left	13	0	0	180		
Volume Right	90	0	24	0		
cSH	1097	1700	1700	1545		
Volume to Capacity	0.09	0.02	0.01	0.12		
Queue Length 95th (ft)	8	0	0	10		
Control Delay (s)	9.6	0.0	0.0	5.6		
Lane LOS	А			А		
Approach Delay (s)	9.6	0.0		5.6		
Approach LOS	А					
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utiliz	zation		29.6%	IC	U Level o	f Service
Analysis Period (min)			15			

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$		٦	ef 🔰			र्च	1		\$	
Volume (veh/h)	0	20	46	57	93	0	31	1	15	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	50	62	101	0	34	1	16	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									7			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	101			72			272	272	47	280	297	101
vC1, stage 1 conf vol									••	200		
vC2, stage 2 conf vol												
vCu, unblocked vol	101			72			272	272	47	280	297	101
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)								0.0	0.0		0.0	0.2
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			96			95	100	98	100	100	100
cM capacity (veh/h)	1491			1528			660	609	1011	640	590	954
		WB 1		NB 1	SB 1		000	007	1011	010	070	701
Direction, Lane # Volume Total	EB 1 72	62	WB 2 101	51	0							
Volume Left	0	62	0	34	0							
	50	02	0	34 16	0							
Volume Right cSH	1491	1528	1700	967	1700							
Volume to Capacity	0.00	0.04	0.06	0.05	0.00							
Queue Length 95th (ft)	0.00	0.04	0.00	0.05	0.00							
Control Delay (s)	0.0	5 7.5	0.0	4	0.0							
	0.0		0.0									
Lane LOS	0.0	A 20		B	A							
Approach Delay (s)	0.0	2.8		10.1	0.0							
Approach LOS				В	А							
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utiliza	ation		19.8%	IC	CU Level o	of Service			А			
Analysis Period (min)			15									

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$		ľ	¢Î			र्च	1		\$	
Volume (veh/h)	1	92	72	35	51	1	30	1	58	0	2	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	100	78	38	55	1	33	1	63	0	2	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									7			
Median type		None			None				,			
Median storage veh)		None			None							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	57			178			276	274	139	305	312	56
vC1, stage 1 conf vol	57			170			270	2/7	137	303	512	50
vC2, stage 2 conf vol												
vCu, unblocked vol	57			178			276	274	139	305	312	56
tC, single (s)	4.1			4.1			7.2	6.5	6.5	7.1	6.5	6.2
tC, 2 stage (s)	4.1			4.1			1.2	0.5	0.5	7.1	0.5	0.2
tF (s)	2.2			2.2			3.6	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			97			95	100	93	100	100	100
cM capacity (veh/h)	1548			1398			643	616	849	585	586	1011
							043	010	047	000	560	1011
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	179	38	57	97	4							
Volume Left	1	38	0	33	0							
Volume Right	78	0	1	63	2							
cSH	1548	1398	1700	1303	742							
Volume to Capacity	0.00	0.03	0.03	0.07	0.01							
Queue Length 95th (ft)	0	2	0	6	0							
Control Delay (s)	0.1	7.6	0.0	10.0	9.9							
Lane LOS	А	А		В	А							
Approach Delay (s)	0.1	3.1		10.0	9.9							
Approach LOS				В	А							
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utiliza	ation		31.0%	IC	CU Level o	of Service			А			
Analysis Period (min)			15									
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K-10 & DG CO 1057 (North Ramps)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					\$			ę			4Î	
Volume (veh/h)	0	0	0	0	0	38	0	30	0	0	43	77
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	41	0	33	0	0	47	84
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	162	121	89	121	163	33	130			33		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	162	121	89	121	163	33	130			33		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	96	100			100		
cM capacity (veh/h)	771	769	970	854	729	1041	1455			1579		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	41	33	130									
Volume Left	41	0	0									
Volume Right	41	0	84									
cSH	1041	1455	1700									
Volume to Capacity	0.04	0.00	0.08									
Queue Length 95th (ft)	3	0.00	0.00									
Control Delay (s)	8.6	0.0	0.0									
Lane LOS	A	0.0	0.0									
Approach Delay (s)	8.6	0.0	0.0									
Approach LOS	A	0.0	0.0									
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utiliza	ation		17.0%	IC	CU Level (of Service			А			
Analysis Period (min)			15									
			10									

K-10 & DG CO 1057 (North Ramps)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					÷			ا			et	
Volume (veh/h)	0	0	0	1	0	24	2	64	0	0	77	36
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1	0	26	2	70	0	0	84	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	203	177	103	177	197	70	123			70		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	203	177	103	177	197	70	123			70		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.5	2.2			2.2		
p0 queue free %	100	100	100	100	100	97	100			100		
cM capacity (veh/h)	733	715	952	784	698	945	1464			1531		
				101	0.00	, 10						
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	27	72	123									
Volume Left	1	2	0									_
Volume Right	26	0	39									
cSH	938	1464	1700									
Volume to Capacity	0.03	0.00	0.07									
Queue Length 95th (ft)	2	0	0									_
Control Delay (s)	9.0	0.2	0.0									
Lane LOS	А	A										
Approach Delay (s)	9.0	0.2	0.0									
Approach LOS	А											
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utiliza	ation		16.2%	IC	CU Level	of Service			А			
Analysis Period (min)			15									

K-10 & DG CO 1057 (South Ramps)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4						4			र्भ	
Volume (veh/h)	42	0	0	0	0	0	0	2	0	38	3	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	0	0	0	0	0	0	2	0	41	3	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	88	88	3	88	88	2	3			2		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88	88	3	88	88	2	3			2		
tC, single (s)	7.4	6.5	6.2	7.1	6.5	6.2	4.1			4.4		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.3	3.5	4.0	3.3	2.2			2.5		
p0 queue free %	94	100	100	100	100	100	100			97		
cM capacity (veh/h)	808	779	1081	878	779	1082	1619			1444		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	46	2	45									
Volume Left	46	0	41									
Volume Right	0	0	0									
cSH	808	1700	1444									
Volume to Capacity	0.06	0.00	0.03									
Queue Length 95th (ft)	4	0	2									
Control Delay (s)	9.7	0.0	7.0									
Lane LOS	A	010	A									
Approach Delay (s)	9.7	0.0	7.0									
Approach LOS	A											
Intersection Summary												
Average Delay			8.2									
Intersection Capacity Utiliza	ation		18.9%	IC	CU Level	of Service			А			
Analysis Period (min)			15									

K-10 & DG CO 1057 (South Ramps)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4						4			र्भ	
Volume (veh/h)	61	0	2	0	0	0	0	5	2	74	4	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	66	0	2	0	0	0	0	5	2	80	4	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	172	173	4	174	172	7	4			8		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	172	173	4	174	172	7	4			8		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2			2.4		
p0 queue free %	91	100	100	100	100	100	100			95		
cM capacity (veh/h)	712	682	1079	755	683	1076	1617			1503		
Direction, Lane #	EB 1	NB 1	SB 1			1070						
Volume Total	68		85									
		8										
Volume Left	66	0	80									_
Volume Right	2	2	0									
cSH Valuma ta Canacitu	720	1700	1503									_
Volume to Capacity	0.10	0.00	0.05									
Queue Length 95th (ft)	8	0	4									
Control Delay (s)	10.5	0.0	7.2									
Lane LOS	B	0.0	A									_
Approach Delay (s)	10.5	0.0	7.2									
Approach LOS	В											
Intersection Summary												
Average Delay			8.3									
Intersection Capacity Utiliza	ation		21.1%	IC	CU Level	of Service			А			
Analysis Period (min)			15									

APPENDIX III

Summary of Peak-Hours Traffic Counts

- All Vehicles
- Trucks Only

Intersection of Noria Rd & N 1500 Rd Morning Peak-Hours Sunny, Hot File Name : Noria & N 1500 -eam Site Code : 1 Start Date : 7/11/2012 Page No : 1

									Grou	ps Printed	- Unshifte										
			Plant Drive rom North					1500 Rd rom East					Noria Rd rom Soutl	h				l 1500 Rd rom West			
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
06:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	6	0	6	11	0	0	0	11	18
06:15 AM	0	0	0	0	0	0	1	0	0	1	0	1	10	0	11	21	2	0	0	23	35
06:30 AM	0	0	0	0	0	0	1	1	0	2	0	1	21	0	22	19	1	1	0	21	45
06:45 AM	0	1	0	0	1	0	1	0	0	1	1	0	20	0	21	32	3	0	0	35	58
Total	1	1	0	0	2	0	3	1	0	4	1	2	57	0	60	83	6	1	0	90	156
07:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	18	0	18	11	0	0	0	11	30
07:15 AM	0	0	0	0	0	1	1	0	0	2	0	0	32	0	32	20	1	0	0	21	55
07:30 AM	0	0	0	0	0	0	4	0	0	4	0	1	26	0	27	26	0	0	0	26	57
07:45 AM	0	1	0	0	1	0	1	1	0	2	0	0	40	0	40	49	3	0	0	52	95
Total	0	1	0	0	1	1	7	1	0	9	0	1	116	0	117	106	4	0	0	110	237
08:00 AM	0	0	0	0	0	0	3	0	0	3	1	1	27	0	29	19	2	0	0	21	53
08:15 AM	0	1	0	0	1	1	2	1	0	4	1	0	24	0	25	28	2	0	0	30	60
08:30 AM	0	1	0	0	1	0	1	0	0	1	1	3	18	0	22	18	2	0	0	20	44
08:45 AM	0	3	0	0	3	0	1	0	0	1	0	0	20	0	20	19	0	0	0	19	43
Total	0	5	0	0	5	1	7	1	0	9	3	4	89	0	96	84	6	0	0	90	200
Grand Total	1	7	0	0	8	2	17	3	0	22	4	7	262	0	273	273	16	1	0	290	593
Apprch %	12.5	87.5	0	0		9.1	77.3	13.6	0		1.5	2.6	96	0		94.1	5.5	0.3	0		
Total %	0.2	1.2	0	0	1.3	0.3	2.9	0.5	0	3.7	0.7	1.2	44.2	0	46	46	2.7	0.2	0	48.9	

Intersection of Noria Rd & N 1500 Rd Morning Peak-Hours Sunny, Hot File Name : Noria & N 1500 -eam Site Code : 1 Start Date : 7/11/2012 Page No : 2

			Plant Dr From Nor	,				N 1500 R From Eas				F	Noria R From Sou					N 1500 R From We			
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
Peak Hour Analysis Fr	om 06:00 A	M to 08:45	AM - Peak	1 of 1			I														
Peak Hour for Entire In	ntersection E	Begins at 07	7:30 AM																		
07:30 AM	0	0	0	0	0	0	4	0	0	4	0	1	26	0	27	26	0	0	0	26	57
07:45 AM	0	1	0	0	1	0	1	1	0	2	0	0	40	0	40	49	3	0	0	52	95
08:00 AM	0	0	0	0	0	0	3	0	0	3	1	1	27	0	29	19	2	0	0	21	53
08:15 AM	0	1	0	0	1	1	2	1	0	4	1	0	24	0	25	28	2	0	0	30	60
Total Volume	0	2	0	0	2	1	10	2	0	13	2	2	117	0	121	122	7	0	0	129	265
% App. Total	0	100	0	0		7.7	76.9	15.4	0		1.7	1.7	96.7	0		94.6	5.4	0	0		
PHF	.000	.500	.000	.000	.500	.250	.625	.500	.000	.813	.500	.500	.731	.000	.756	.622	.583	.000	.000	.620	.697

Intersection of Noria Rd & N 1500 Rd Afternoon Peak-Hours Sunny, Hot File Name : Noria & N 1500 -epm Site Code : 1 Start Date : 7/11/2012 Page No : 1

	Groups Printed- Unshifted Sand Plant Driveway N 1500 Rd Noria Rd																				
			Plant Drive					1500 Rd from East					Noria Rd rom Soutl	h				l 1500 Rd rom West			
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
02:00 PM	1	2	0	0	3	0	2	0	0	2	0	0	19	0	19	13	3	1	0	17	41
02:15 PM	0	1	0	0	1	0	0	0	0	0	1	1	9	0	11	19	2	0	0	21	33
02:30 PM	0	0	0	0	0	0	2	1	0	3	1	1	15	0	17	24	3	0	0	27	47
02:45 PM	0	1	0	0	1	0	1	0	0	1	1	0	16	0	17	16	3	0	0	19	38
Total	1	4	0	0	5	0	5	1	0	6	3	2	59	0	64	72	11	1	0	84	159
03:00 PM	0	1	0	0	1	0	0	0	0	0	0	1	29	0	30	19	0	0	0	19	50
03:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	28	0	28	17	2	0	0	19	49
03:30 PM	0	1	0	0	1	0	3	1	0	4	0	3	52	0	55	26	4	0	0	30	90
03:45 PM	0	1	0	0	1	0	2	0	0	2	0	2	20	0	22	25	2	0	0	27	52
Total	0	3	0	0	3	0	7	1	0	8	0	6	129	0	135	87	8	0	0	95	241
04:00 PM	0	5	0	0	5	0	0	0	0	0	0	0	27	0	27	23	4	1	0	28	60
04:15 PM	1	0	0	0	1	0	4	0	0	4	0	0	14	0	14	35	4	0	0	39	58
04:30 PM	0	2	0	0	2	0	2	0	0	2	1	1	53	0	55	25	1	0	0	26	85
04:45 PM	1	0	0	0	1	0	3	1	0	4	0	0	23	0	23	47	2	0	0	49	77
Total	2	7	0	0	9	0	9	1	0	10	1	1	117	0	119	130	11	1	0	142	280
Grand Total	3	14	0	0	17	0	21	3	0	24	4	9	305	0	318	289	30	2	0	321	680
Apprch %	17.6	82.4	0	0		0	87.5	12.5	0		1.3	2.8	95.9	0		90	9.3	0.6	0		
Total %	0.4	2.1	0	0	2.5	0	3.1	0.4	0	3.5	0.6	1.3	44.9	0	46.8	42.5	4.4	0.3	0	47.2	

Intersection of Noria Rd & N 1500 Rd Afternoon Peak-Hours Sunny, Hot File Name : Noria & N 1500 -epm Site Code : 1 Start Date : 7/11/2012 Page No : 2

			Plant Dr rom Nor	,				N 1500 R From Ea					Noria R From Sou					N 1500 R From We			
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
Peak Hour Analysis Fr	om 02:00 P	M to 04:45	PM - Peak	1 of 1												1					
Peak Hour for Entire In	itersection E	Begins at 04	:00 PM																		
04:00 PM	0	5	0	0	5	0	0	0	0	0	0	0	27	0	27	23	4	1	0	28	60
04:15 PM	1	0	0	0	1	0	4	0	0	4	0	0	14	0	14	35	4	0	0	39	58
04:30 PM	0	2	0	0	2	0	2	0	0	2	1	1	53	0	55	25	1	0	0	26	85
04:45 PM	1	0	0	0	1	0	3	1	0	4	0	0	23	0	23	47	2	0	0	49	77
Total Volume	2	7	0	0	9	0	9	1	0	10	1	1	117	0	119	130	11	1	0	142	280
% App. Total	22.2	77.8	0	0		0	90	10	0		0.8	0.8	98.3	0		91.5	7.7	0.7	0		
PHF	.500	.350	.000	.000	.450	.000	.563	.250	.000	.625	.250	.250	.552	.000	.541	.691	.688	.250	.000	.724	.824

Intersection of Noria Rd & DG CO 442 Morning Peak-Hours Sunny, Hot File Name : CR 442 & Noria-eam Site Code : 2 Start Date : 7/12/2012 Page No : 1

										ps Printed	- Unshift										_
			Noria Rd					G CO 442					Voria Rd	_			Г.				
Start Time		Thru	rom North Left	1	App. Total	Right	1	From East Left		App. Total	Right	Thru	om South	1	App. Total		Fr	om Wes	t	App. Total	Int. Total
06:00 AM	0	4	2	0	App. Total 6	13	0	1	0	App. Total 14		6	0	0	App. Total 7	0	0	0	0	App. Total	27
					-			1			1				'						
06:15 AM	0	3	3	0	6	11	0	0	0	11	1	9	0	0	10	0	0	0	0	0	27
06:30 AM	0	3	5	0	8	22	0	2	0	24	5	16	0	0	21	0	0	0	0	0	53
06:45 AM	0	0	8	0	8	27	0	2	0	29	8	28	0	0	36	0	0	0	0	0	73
Total	0	10	18	0	28	73	0	5	0	78	15	59	0	0	74	0	0	0	0	0	180
07:00 AM	0	5	8	0	13	23	0	4	0	27	4	17	0	0	21	0	0	0	0	0	61
07:15 AM	0	0	11	0	11	29	0	2	0	31	5	17	0	0	22	0	0	0	0	0	64
07:30 AM	0	3	4	0	7	42	0	5	0	47	2	16	0	0	18	0	0	0	0	0	72
07:45 AM	0	4	6	0	10	25	0	7	0	32	8	37	0	0	45	0	0	0	0	0	87
Total	0	12	29	0	41	119	0	18	0	137	19	87	0	0	106	0	0	0	0	0	284
08:00 AM	0	2	10	0	12	26	0	3	0	29	7	25	0	0	32	0	0	0	0	0	73
08:15 AM	0	6	11	0	17	26	0	1	0	27	5	20	0	0	25	0	0	0	0	0	69
08:30 AM	0	10	4	0	14	18	0	6	0	24	2	14	0	0	16	0	0	0	0	0	54
08:45 AM	0	6	6	0	12	5	0	8	0	13	1	17	0	0	18	0	0	0	0	0	43
Total	0	24	31	0	55	75	0	18	0	93	15	76	0	0	91	0	0	0	0	0	239
Grand Total	0	46	78	0	124	267	0	41	0	308	49	222	0	0	271	0	0	0	0	0	703
Apprch %	0	37.1	62.9	0		86.7	0	13.3	0		18.1	81.9	0	0		0	0	0	0		
Total %	0	6.5	11.1	0	17.6	38	0	5.8	0	43.8	7	31.6	0	0	38.5	0	0	0	0	0	

Intersection of Noria Rd & DG CO 442 Morning Peak-Hours Sunny, Hot File Name : CR 442 & Noria-eam Site Code : 2 Start Date : 7/12/2012 Page No : 2

			Noria Ro From Nor					DG CO 44 From Eas				F	Noria Ro rom Sou				F	From We	st		
Start Time		Thru	Left		App. Total	Right		Left		App. Total	Right	Thru			App. Total					App. Total	Int. Total
Peak Hour Analysis Fro	om 06:00 Al	V to 08:45	AM - Peak	1 of 1																	
Peak Hour for Entire In	tersection E	Begins at 07	7:30 AM																		
07:30 AM	0	3	4	0	7	42	0	5	0	47	2	16	0	0	18	0	0	0	0	0	72
07:45 AM	0	4	6	0	10	25	0	7	0	32	8	37	0	0	45	0	0	0	0	0	87
08:00 AM	0	2	10	0	12	26	0	3	0	29	7	25	0	0	32	0	0	0	0	0	73
08:15 AM	0	6	11	0	17	26	0	1	0	27	5	20	0	0	25	0	0	0	0	0	69
Total Volume	0	15	31	0	46	119	0	16	0	135	22	98	0	0	120	0	0	0	0	0	301
% App. Total	0	32.6	67.4	0		88.1	0	11.9	0		18.3	81.7	0	0		0	0	0	0		
PHF	.000	.625	.705	.000	.676	.708	.000	.571	.000	.718	.688	.662	.000	.000	.667	.000	.000	.000	.000	.000	.865

Intersection of DG CO 442 & Noria Rd Afternoon Peak-Hours Sunny, Hot File Name : CR 442 & Noria-epm Site Code : 2 Start Date : 7/12/2012 Page No : 1

									Grou	os Printed	- Unshift	ed									
			oria Road					G CO 442					oria Road				г.	om Wes			
Start Time		Thru	rom North Left	1	App. Total	Right	F	From East		App. Total	Right	Thru	om Sout	n	App. Total		Fr	om wes	ι	App. Total	Int. Total
02:00 PM	0	9	9	0	дрр. тоtал 18	16	0	7	0	23	7	2	0	0	<u>Арр. тотаг</u> 9	0	0	0	0	<u>Арр. тотаг</u> О	50
02:15 PM	0	6	14	0	20	14	0	3	0	17	, 7	10	0	0	17	0	0	0	0	0	54
																				-	
02:30 PM	0	12	18	0	30	14	0	6	0	20	6	4	0	0	10	0	0	0	0	0	60
02:45 PM	0	5	19	0	24	8	0	8	0	16	5	7	0	0	12	0	0	0	0	0	52
Total	0	32	60	0	92	52	0	24	0	76	25	23	0	0	48	0	0	0	0	0	216
03:00 PM	0	5	32	0	37	9	0	4	0	13	5	3	0	0	8	0	0	0	0	0	58
03:15 PM	0	3	16	0	19	19	0	6	0	25	2	12	0	0	14	0	0	0	0	0	58
03:30 PM	0	24	30	0	54	11	0	3	0	14	5	7	0	0	12	0	0	0	0	0	80
03:45 PM		7				7														-	
	0		23	0	30		0	5	0	12	5	8	0	0	13	0	0	0	0	0	55
Total	0	39	101	0	140	46	0	18	0	64	17	30	0	0	47	0	0	0	0	0	251
04:00 PM	0	24	34	0	58	20	0	4	0	24	5	4	0	0	9	0	0	0	0	0	91
04:15 PM	0	13	33	0	46	19	0	4	0	23	5	11	0	0	16	0	0	0	0	0	85
04:30 PM	0	23	36	0	59	13	0	2	0	15	8	9	0	0	17	0	0	0	0	0	91
04:45 PM	0	12	43	0	55	11	0	2	0	13	4	8	0	0	12	0	0	0	0	0	80
Total	0	72	146	0	218	63	0	12	0	75	22	32	0	0	54	0	0	0	0	0	347
Grand Total	0	143	307	0	450	161	0	54	0	215	64	85	0	0	149	0	0	0	0	0	814
Apprch %	0	31.8	68.2	0		74.9	0	25.1	0		43	57	0	0		0	0	0	0		
Total %	0	17.6	37.7	0	55.3	19.8	0	6.6	0	26.4	7.9	10.4	0	0	18.3	0	0	0	0	0	

Intersection of DG CO 442 & Noria Rd Afternoon Peak-Hours Sunny, Hot File Name : CR 442 & Noria-epm Site Code : 2 Start Date : 7/12/2012 Page No : 2

			Noria Ro From Nor					DG CO 44 From Eas					Noria Roa From Sou				F	From We	st		
Start Time		Thru	Left		App. Total	Right		Left		App. Total	Right	Thru			App. Total					App. Total	Int. Total
Peak Hour Analysis Fro	om 02:00 P	M to 04:45	PM - Peak	1 of 1																	
Peak Hour for Entire In	tersection I	Begins at 04	1:00 PM																		
04:00 PM	0	24	34	0	58	20	0	4	0	24	5	4	0	0	9	0	0	0	0	0	91
04:15 PM	0	13	33	0	46	19	0	4	0	23	5	11	0	0	16	0	0	0	0	0	85
04:30 PM	0	23	36	0	59	13	0	2	0	15	8	9	0	0	17	0	0	0	0	0	91
04:45 PM	0	12	43	0	55	11	0	2	0	13	4	8	0	0	12	0	0	0	0	0	80
Total Volume	0	72	146	0	218	63	0	12	0	75	22	32	0	0	54	0	0	0	0	0	347
% App. Total	0	33	67	0		84	0	16	0		40.7	59.3	0	0		0	0	0	0		
PHF	.000	.750	.849	.000	.924	.788	.000	.750	.000	.781	.688	.727	.000	.000	.794	.000	.000	.000	.000	.000	.953

Intersection of CO Rd 442 & CO Rd 1057 Morning Peak-Hours Sunny, Hot Other: File Name : CR 442 & CR 1057-eam Site Code : 3 Start Date : 7/17/2012 Page No : 1

										ps Printed	Unshifte										
			E 1900 Rd rom North					G CO 442 rom East					G CO 1057 om South					G CO 442 rom West			
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
06:00 AM	1	0	0	0	1	0	15	6	0	21	2	0	2	0	4	5	2	0	0	7	33
06:15 AM	0	0	0	0	0	0	14	8	0	22	2	0	0	0	2	1	3	0	0	4	28
06:30 AM	0	0	0	0	0	0	37	15	0	52	2	0	1	0	3	10	3	0	0	13	68
06:45 AM	0	0	0	0	0	0	15	15	0	30	5	1	2	0	8	5	4	0	0	9	47
Total	1	0	0	0	1	0	81	44	0	125	11	1	5	0	17	21	12	0	0	33	176
07:00 AM	0	0	0	0	0	0	18	11	0	29	3	0	3	0	6	8	11	0	0	19	54
07:15 AM	0	0	0	0	0	0	23	16	0	39	5	0	5	0	10	3	2	0	0	5	54
07:30 AM	0	0	0	0	0	0	16	8	0	24	5	1	10	0	16	6	3	0	0	9	49
07:45 AM	0	0	0	0	0	0	20	18	0	38	4	0	7	0	11	4	2	0	0	6	55
Total	0	0	0	0	0	0	77	53	0	130	17	1	25	0	43	21	18	0	0	39	212
08:00 AM	0	3	0	0	3	0	16	6	0	22	5	0	6	0	11	8	3	0	0	11	47
08:15 AM	0	1	0	0	1	1	12	5	0	18	8	1	5	0	14	1	11	0	0	12	45
08:30 AM	0	0	0	0	0	1	7	2	0	10	8	0	2	0	10	2	6	0	0	8	28
08:45 AM	0	1	1	0	2	0	4	9	0	13	4	0	1	0	5	3	6	0	0	9	29
Total	0	5	1	0	6	2	39	22	0	63	25	1	14	0	40	14	26	0	0	40	149
Grand Total	1	5	1	0	7	2	197	119	0	318	53	3	44	0	100	56	56	0	0	112	537
Apprch %	14.3	71.4	14.3	0		0.6	61.9	37.4	0		53	3	44	0		50	50	0	0		
Total %	0.2	0.9	0.2	0	1.3	0.4	36.7	22.2	0	59.2	9.9	0.6	8.2	0	18.6	10.4	10.4	0	0	20.9	

Intersection of CO Rd 442 & CO Rd 1057 Morning Peak-Hours Sunny, Hot Other: File Name : CR 442 & CR 1057-eam Site Code : 3 Start Date : 7/17/2012 Page No : 2

			E 1900 F From Nor					DG CO 44 From Eas					G CO 10 rom Sou					DG CO 44 From We			
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
Peak Hour Analysis Fro	om 06:00 A	M to 08:45	AM - Peak	1 of 1			1														
Peak Hour for Entire In	tersection E	Begins at O	5:30 AM																		
06:30 AM	0	0	0	0	0	0	37	15	0	52	2	0	1	0	3	10	3	0	0	13	68
06:45 AM	0	0	0	0	0	0	15	15	0	30	5	1	2	0	8	5	4	0	0	9	47
07:00 AM	0	0	0	0	0	0	18	11	0	29	3	0	3	0	6	8	11	0	0	19	54
07:15 AM	0	0	0	0	0	0	23	16	0	39	5	0	5	0	10	3	2	0	0	5	54
Total Volume	0	0	0	0	0	0	93	57	0	150	15	1	11	0	27	26	20	0	0	46	223
% App. Total	0	0	0	0		0	62	38	0		55.6	3.7	40.7	0		56.5	43.5	0	0		
PHF	.000	.000	.000	.000	.000	.000	.628	.891	.000	.721	.750	.250	.550	.000	.675	.650	.455	.000	.000	.605	.820

Intersection of CO Rd 442 & CO Rd 1057 Afternoon Peak-Hours Sunny, Hot File Name : CR 442 & CR 1057-epm Site Code : 3 Start Date : 7/17/2012 Page No : 1

										ps Printed	- Unshift										
			E 1900 Rd. rom North					G CO 442 rom East					G CO 105 rom Sout					G CO 442 rom West			
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
02:00 PM	0	0	0	0	0	0	11	6	0	17	14	1	2	0	17	5	9	0	0	14	48
02:15 PM	1	1	2	0	4	0	7	6	0	13	14	0	1	0	15	4	12	0	0	16	48
02:30 PM	0	0	0	0	0	0	20	6	0	26	15	0	0	0	15	2	15	1	0	18	59
02:45 PM	0	0	0	0	0	0	11	5	0	16	11	0	3	0	14	0	10	0	0	10	40
Total	1	1	2	0	4	0	49	23	0	72	54	1	6	0	61	11	46	1	0	58	195
03:00 PM	0	0	0	0	0	0	9	8	0	17	14	0	2	0	16	10	22	0	0	32	65
03:15 PM	0	0	0	0	0	0	15	8	0	23	9	0	3	0	12	1	11	0	0	12	47
03:30 PM	0	0	0	0	0	0	11	9	0	20	13	1	0	0	14	10	22	0	0	32	66
03:45 PM	0	0	0	0	0	0	12	3	0	15	10	3	2	0	15	6	18	0	0	24	54
Total	0	0	0	0	0	0	47	28	0	75	46	4	7	0	57	27	73	0	0	100	232
04:00 PM	0	1	0	0	1	0	14	8	0	22	15	0	2	0	17	16	18	0	0	34	74
04:15 PM	0	0	0	0	0	0	9	7	0	16	15	0	5	0	20	11	21	0	0	32	68
04:30 PM	1	0	0	0	1	1	16	11	0	28	15	1	1	0	17	18	32	0	0	50	96
04:45 PM	1	1	0	0	2	0	12	9	0	21	13	0	2	0	15	7	21	1	0	29	67
Total	2	2	0	0	4	1	51	35	0	87	58	1	10	0	69	52	92	1	0	145	305
Grand Total	3	3	2	0	8	1	147	86	0	234	158	6	23	0	187	90	211	2	0	303	732
Apprch %	37.5	37.5	25	0		0.4	62.8	36.8	0		84.5	3.2	12.3	0		29.7	69.6	0.7	0		
Total %	0.4	0.4	0.3	0	1.1	0.1	20.1	11.7	0	32	21.6	0.8	3.1	0	25.5	12.3	28.8	0.3	0	41.4	

Intersection of CO Rd 442 & CO Rd 1057 Afternoon Peak-Hours Sunny, Hot File Name : CR 442 & CR 1057-epm Site Code : 3 Start Date : 7/17/2012 Page No : 2

			E 1900 R From Nor					DG CO 44 From Eas					G CO 10 rom Sou					DG CO 44 From We			
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
Peak Hour Analysis Fro	om 02:00 Pl	M to 04:45	PM - Peak	1 of 1			1								1	1					
Peak Hour for Entire In	tersection E	Begins at 04	1:00 PM																		
04:00 PM	0	1	0	0	1	0	14	8	0	22	15	0	2	0	17	16	18	0	0	34	74
04:15 PM	0	0	0	0	0	0	9	7	0	16	15	0	5	0	20	11	21	0	0	32	68
04:30 PM	1	0	0	0	1	1	16	11	0	28	15	1	1	0	17	18	32	0	0	50	96
04:45 PM	1	1	0	0	2	0	12	9	0	21	13	0	2	0	15	7	21	1	0	29	67
Total Volume	2	2	0	0	4	1	51	35	0	87	58	1	10	0	69	52	92	1	0	145	305
% App. Total	50	50	0	0		1.1	58.6	40.2	0		84.1	1.4	14.5	0		35.9	63.4	0.7	0		
PHF	.500	.500	.000	.000	.500	.250	.797	.795	.000	.777	.967	.250	.500	.000	.863	.722	.719	.250	.000	.725	.794

Interchange of K-10 & E 1900 Rd (North Ramps) Morning Peak-Hours Sunny, warm File Name : K10-N Ramps-eam Site Code : 4 Start Date : 7/12/2012 Page No : 1

										ps Printed	Unshift										_
		E 1900 R	d / DG C om North		'			WB Off R rom East					Rd / DG C rom South		7			WB On R			
Start Time	Right	Thru		<u> </u>	App. Total	Right	Thru	Left		App. Total		Thru	Left		App. Total					App. Total	Int. Total
06:00 AM	9	5	0	0	14	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	18
06:15 AM	2	2	0	0	4	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	7
06:30 AM	3	2	0	0	5	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	8
06:45 AM	10	3	0	0	13	1	0	0	0	1	0	8	0	0	8	0	0	0	0	0	22
Total	24	12	0	0	36	2	0	1	0	3	0	16	0	0	16	0	0	0	0	0	55
07:00 AM	16	6	0	0	22	2	0	0	0	2	0	5	0	0	5	0	0	0	0	0	29
07:15 AM	20	8	0	0	28	6	0	0	0	6	0	3	0	0	3	0	0	0	0	0	37
07:30 AM	20	6	0	0	26	5	0	0	0	5	0	11	0	0	11	0	0	0	0	0	42
07:45 AM	20	4	0	0	24	6	0	0	0	6	0	10	0	0	10	0	0	0	0	0	40
Total	76	24	0	0	100	19	0	0	0	19	0	29	0	0	29	0	0	0	0	0	148
08:00 AM	13	5	0	0	18	1	0	1	0	2	0	9	0	0	9	0	0	0	0	0	29
08:15 AM	14	6	0	0	20	1	0	0	0	1	0	12	1	0	13	0	0	0	0	0	34
08:30 AM	12	2	0	0	14	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	18
08:45 AM	16	0	0	0	16	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	23
Total	55	13	0	0	68	2	0	1	0	3	0	31	2	0	33	0	0	0	0	0	104
Grand Total	155	49	0	0	204	23	0	2	0	25	0	76	2	0	78	0	0	0	0	0	307
Apprch %	76	24	0	0		92	0	8	0		0	97.4	2.6	0		0	0	0	0		
Total %	50.5	16	0	0	66.4	7.5	0	0.7	0	8.1	0	24.8	0.7	0	25.4	0	0	0	0	0	

Interchange of K-10 & E 1900 Rd (North Ramps) Morning Peak-Hours Sunny, warm File Name : K10-N Ramps-eam Site Code : 4 Start Date : 7/12/2012 Page No : 2

			Rd / DG From Nor		7			(WB Off From Ea	1.4				Rd / DG rom Sou		1			(WB On F From Wes	17		
Start Time	Right	Thru			App. Total	Right	Thru	Left		App. Total		Thru	Left		App. Total					App. Total	Int. Total
Peak Hour Analysis Fr	om 06:00 Al	M to 08:45	AM - Peak	1 of 1																	
Peak Hour for Entire In	itersection E	Begins at 0	7:00 AM																		
07:00 AM	16	6	0	0	22	2	0	0	0	2	0	5	0	0	5	0	0	0	0	0	29
07:15 AM	20	8	0	0	28	6	0	0	0	6	0	3	0	0	3	0	0	0	0	0	37
07:30 AM	20	6	0	0	26	5	0	0	0	5	0	11	0	0	11	0	0	0	0	0	42
07:45 AM	20	4	0	0	24	6	0	0	0	6	0	10	0	0	10	0	0	0	0	0	40
Total Volume	76	24	0	0	100	19	0	0	0	19	0	29	0	0	29	0	0	0	0	0	148
% App. Total	76	24	0	0		100	0	0	0		0	100	0	0		0	0	0	0		
PHF	.950	.750	.000	.000	.893	.792	.000	.000	.000	.792	.000	.659	.000	.000	.659	.000	.000	.000	.000	.000	.881

Interchange of K-10 & E 1900 Rd (N Ramps) Afternoon Peak-Hours Sunny, Hot File Name : K10-N Ramps-epm Site Code : 4 Start Date : 7/17/2012 Page No : 1

										ps Printed-	Unshift	ed									_
		E 1900 R Fr	d / DG C om North		7			WB Off R rom East					Rd / DG CO rom South					VB On R om Wesi			
Start Time	Right	Thru			App. Total	Right	Thru	Left		App. Total		Thru	Left		App. Total					App. Total	Int. Total
02:00 PM	7	7	0	0	14	2	0	1	0	3	0	18	0	0	18	0	0	0	0	0	35
02:15 PM	5	5	0	0	10	1	0	0	0	1	0	12	2	0	14	0	0	0	0	0	25
02:30 PM	6	3	0	0	9	0	0	3	0	3	0	14	0	0	14	0	0	0	0	0	26
02:45 PM	5	0	0	0	5	2	0	1	0	3	0	11	0	0	11	0	0	0	0	0	19
Total	23	15	0	0	38	5	0	5	0	10	0	55	2	0	57	0	0	0	0	0	105
03:00 PM	9	11	0	0	20	2	0	0	0	2	0	14	1	0	15	0	0	0	0	0	37
03:15 PM	8	1	0	0	9	3	0	0	0	3	0	9	1	0	10	0	0	0	0	0	22
03:30 PM	6	10	0	0	16	1	0	1	0	2	0	17	0	0	17	0	0	0	0	0	35
03:45 PM	8	7	0	0	15	3	0	0	0	3	0	11	0	0	11	0	0	0	0	0	29
Total	31	29	0	0	60	9	0	1	0	10	0	51	2	0	53	0	0	0	0	0	123
04:00 PM	7	15	0	0	22	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	41
04:15 PM	9	10	0	0	19	2	0	0	0	2	0	15	0	0	15	0	0	0	0	0	36
04:30 PM	11	23	0	0	34	0	0	0	0	0	0	16	1	0	17	0	0	0	0	0	51
04:45 PM	8	10	0	0	18	3	0	1	0	4	0	13	1	0	14	0	0	0	0	0	36
Total	35	58	0	0	93	5	0	1	0	6	0	63	2	0	65	0	0	0	0	0	164
Grand Total	89	102	0	0	191	19	0	7	0	26	0	169	6	0	175	0	0	0	0	0	392
Apprch %	46.6	53.4	0	0		73.1	0	26.9	0		0	96.6	3.4	0		0	0	0	0		
Total %	22.7	26	0	0	48.7	4.8	0	1.8	0	6.6	0	43.1	1.5	0	44.6	0	0	0	0	0	

Interchange of K-10 & E 1900 Rd (N Ramps) Afternoon Peak-Hours Sunny, Hot File Name : K10-N Ramps-epm Site Code : 4 Start Date : 7/17/2012 Page No : 2

			Rd / DG From No		7			(WB Off I From Eas	17				Rd / DG rom Sou	CO 1057 uth	1			(WB On From We			
Start Time	Right	Thru			App. Total	Right	Thru	Left		App. Total		Thru	Left		App. Total					App. Total	Int. Total
Peak Hour Analysis Fr	om 02:00 P	M to 04:45	PM - Peak	1 of 1						I											
Peak Hour for Entire In	tersection E	Begins at 0	4:00 PM																		
04:00 PM	7	15	0	0	22	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	41
04:15 PM	9	10	0	0	19	2	0	0	0	2	0	15	0	0	19	0	0	0	0	0	36
04:30 PM	11	23	0	0	34	0	0	0	0	0	0	16	1	0	17	0	0	0	0	0	51
04:45 PM	8	10	0	0	18	3	0	1	0	4	0	13	1	0	14	0	0	0	0	0	36
Total Volume	35	58	0	0	93	5	0	1	0	6	0	63	2	0	65	0	0	0	0	0	164
% App. Total	37.6	62.4	0	0		83.3	0	16.7	0		0	96.9	3.1	0		0	0	0	0		
PHF	.795	.630	.000	.000	.684	.417	.000	.250	.000	.375	.000	.829	.500	.000	.855	.000	.000	.000	.000	.000	.804

Interchange of K-10 & E 1900 Rd (South Ramps) Morning Peak-Hours Sunny, Warm File Name : K10-S Ramps-eam Site Code : 4 Start Date : 7/12/2012 Page No : 1

										ps Printed	- Unshift										_
			Rd / DG C rom North		7			EB On R rom Eas					Rd / DG C om South		,			EB Off R			
Start Time		Thru	Left	1	App. Total					App. Total	Right	Thru		1	App. Total	Right	Thru	Left		App. Total	Int. Total
06:00 AM	0	3	3	0	6	0	0	0	0	0	1	0	0	0	1	0	0	3	0	3	10
06:15 AM	0	0	2	0	2	0	0	0	0	0	2	0	0	0	2	0	0	3	0	3	7
06:30 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4
06:45 AM	0	1	2	0	3	0	0	0	0	0	0	1	0	0	1	0	0	7	0	7	11
Total	0	4	9	0	13	0	0	0	0	0	3	1	0	0	4	0	0	15	0	15	32
07:00 AM	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	11
07:15 AM	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	11
07:30 AM	0	1	5	0	6	0	0	0	0	0	0	1	0	0	1	0	0	10	0	10	17
07:45 AM	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	14
Total	0	1	23	0	24	0	0	0	0	0	0	1	0	0	1	0	0	28	0	28	53
08:00 AM	0	1	5	0	6	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9	15
08:15 AM	0	1	5	0	6	0	0	0	0	0	0	1	0	0	1	0	0	12	0	12	19
08:30 AM	0	1	1	0	2	0	0	0	0	0	1	0	0	0	1	0	0	4	0	4	7
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7	0	8	8
Total	0	3	11	0	14	0	0	0	0	0	1	1	0	0	2	1	0	32	0	33	49
Grand Total	0	8	43	0	51	0	0	0	0	0	4	3	0	0	7	1	0	75	0	76	134
Apprch %	0	15.7	84.3	0		0	0	0	0		57.1	42.9	0	0		1.3	0	98.7	0		
Total %	0	6	32.1	0	38.1	0	0	0	0	0	3	2.2	0	0	5.2	0.7	0	56	0	56.7	

Interchange of K-10 & E 1900 Rd (South Ramps) Morning Peak-Hours Sunny, Warm File Name : K10-S Ramps-eam Site Code : 4 Start Date : 7/12/2012 Page No : 2

			Rd / DG		7			(EB On	1.4				Rd / DG		1			(EB Off I	17		
		ŀ	rom Nor	rth			I	From Ea	st			ŀ	rom Sou	ith			ł	rom We	st		
Start Time		Thru	Left		App. Total					App. Total	Right	Thru			App. Total	Right	Thru	Left		App. Total	Int. Total
Peak Hour Analysis Fro	om 06:00 Al	V to 08:45	AM - Peak	1 of 1																	
Peak Hour for Entire In	itersection B	legins at 07	7:30 AM																		
07:30 AM	0	1	5	0	6	0	0	0	0	0	0	1	0	0	1	0	0	10	0	10	17
07:45 AM	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	14
08:00 AM	0	1	5	0	6	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9	15
08:15 AM	0	1	5	0	6	0	0	0	0	0	0	1	0	0	1	0	0	12	0	12	19
Total Volume	0	3	19	0	22	0	0	0	0	0	0	2	0	0	2	0	0	41	0	41	65
% App. Total	0	13.6	86.4	0		0	0	0	0		0	100	0	0		0	0	100	0		
PHF	.000	.750	.950	.000	.917	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.854	.000	.854	.855

Interchange of K-10 & E 1900 Rd (S Ramps) Afternoon Peak-Hours Sunny, Hot File Name : K10-S Ramps-epm Site Code : 4 Start Date : 7/17/2012 Page No : 1

										ps Printed	Unshifte										
) / DG CO rom North					EB On R rom East					/ DG CO ' om South					(EB Off Ra rom West			
Start Time		Thru	Left	1	App. Total				ι	App. Total	Right	Thru	JII SOUII		App. Total	Right	Thru	Left		App. Total	Int. Total
02:00 PM	0	2	6	0	8	0	0	0	0	0 Npp: 10tai	0	1	0	0	1	0	0	17	0	17	26
02:15 PM	0	0	5	0	5	0	0	0	0	0	2	2	0	0	4	1	0	12	0	13	22
02:30 PM	0	2	4	0	6	0	0	0	0	0	- 1	0	0	0	1	0	0	14	0	14	21
02:30 PM		2			1					-	1										
	0		0	0		0	0	0	0	0	0	0	0	0	0	0	0	11	0	11	12
Total	0	5	15	0	20	0	0	0	0	0	3	3	0	0	6	1	0	54	0	55	81
03:00 PM	0	0	11	0	11	0	0	0	0	0	0	1	0	0	1	0	0	15	0	15	27
03:15 PM	0	0	1	0	1	0	0	0	0	0	2	2	0	0	4	0	0	8	0	8	13
03:30 PM	0	0	11	0	11	0	0	0	0	0	0	0	0	0	0	0	0	17	0	17	28
03:45 PM	0	1	6	0	7	0	0	0	0	0	0	0	0	0	0	2	0	11	0	13	20
Total	0	1	29	0	30	0	0	0	0	0	2	3	0	0	5	2	0	51	0	53	88
04:00 PM	0	0	15	0	15	0	0	0	0	0	0	0	0	0	0	0	0	19	0	19	34
04:15 PM	0	0	10	0	10	0	0	0	0	0	1	2	0	0	3	1	0	13	0	14	27
04:30 PM	0	0	23	0	23	0	0	0	0	0	1	1	0	0	2	0	0	16	0	16	41
04:45 PM	0	4	7	0	11	0	0	0	0	0	0	2	0	0	2	1	0	12	0	13	26
Total	0	4	55	0	59	0	0	0	0	0	2	5	0	0	7	2	0	60	0	62	128
Grand Total	0	10	99	0	109	0	0	0	0	0	7	11	0	0	18	5	0	165	0	170	297
Apprch %	0	9.2	90.8	0		0	0	0	0		38.9	61.1	0	0		2.9	0	97.1	0		
Total %	0	3.4	33.3	0	36.7	0	0	0	0	0	2.4	3.7	0	0	6.1	1.7	0	55.6	0	57.2	

Interchange of K-10 & E 1900 Rd (S Ramps) Afternoon Peak-Hours Sunny, Hot File Name : K10-S Ramps-epm Site Code : 4 Start Date : 7/17/2012 Page No : 2

			0 / DG C From Nor					(EB On F From Eas					0 / DG C					(EB Off From We			
Start Time		Thru	Left		App. Total					App. Total	Right	Thru			App. Total	Right	Thru	Left		App. Total	Int. Total
Peak Hour Analysis Fro	om 02:00 Pl	VI to 04:45	PM - Peak	1 of 1																	
Peak Hour for Entire Int	tersection E	Begins at 04	4:00 PM																		
04:00 PM	0	0	15	0	15	0	0	0	0	0	0	0	0	0	0	0	0	19	0	19	34
04:15 PM	0	0	10	0	10	0	0	0	0	0	1	2	0	0	3	1	0	13	0	14	27
04:30 PM	0	0	23	0	23	0	0	0	0	0	1	1	0	0	2	0	0	16	0	16	41
04:45 PM	0	4	7	0	11	0	0	0	0	0	0	2	0	0	2	1	0	12	0	13	26
Total Volume	0	4	55	0	59	0	0	0	0	0	2	5	0	0	7	2	0	60	0	62	128
% App. Total	0	6.8	93.2	0		0	0	0	0		28.6	71.4	0	0		3.2	0	96.8	0		
PHF	.000	.250	.598	.000	.641	.000	.000	.000	.000	.000	.500	.625	.000	.000	.583	.500	.000	.789	.000	.816	.780

Intersection of Noria Rd & N 1500 Rd Morning Peak-Hours Sunny, Hot File Name : Noria & N 1500 -eam-truck Site Code : 1 Start Date : 7/11/2012 Page No : 1

										ps Printed	Unshift										
			Plant Dri rom Nort					1500 Rc					Noria Rd	_				1500 Rd			
Start Time	Right	Thru	Left	.n	Ann Total	Right	Thru	From East	<u>ا</u>	Ann Total	Diaht	Thru	rom South		Ann Total	Diabt	F Thru	rom Wes	ι 	App. Total	Int. Total
*** BREAK ***	Right	THIU	Leit		App. Total	Right	IIIIU	Len		App. Total	Right	TINU	Leit		App. Total	Right	IIIIU	Leit		App. Total	IIII. TUIdI
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
*** BREAK ***					I					I											
06:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	3
*** BREAK ***																					
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
00.00.444	0	0	0	0		0	0	0	0		0	1	0	0	1	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	I	0	0	1	0	0	0	0	0	I
08:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
08:45 AM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
Grand Total	0	6	0	0	6	0	0	0	0	0	0	6	0	0	6	0	1	0	0	1	13
Apprch %	0	100	0	0		0	0	0	0		0	100	0	0		0	100	0	0		
Total %	0	46.2	0	0	46.2	0	0	0	0	0	0	46.2	0	0	46.2	0	7.7	0	0	7.7	

Intersection of Noria Rd & N 1500 Rd Morning Peak-Hours Sunny, Hot File Name : Noria & N 1500 -eam-truck Site Code : 1 Start Date : 7/11/2012 Page No : 2

			Plant Dr From Nor	,				N 1500 R From Eas				F	Noria R					N 1500 R From We			
			1011110					Tom Eds	•				10111 000					1011110	51		
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
Peak Hour Analysis Fr	om 06:00 A	M to 08:45	AM - Peak	1 of 1																	
Peak Hour for Entire In	ntersection E	Begins at 08	8:00 AM																		
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
08:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
08:45 AM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.333	.000	.000	.333	.000	.000	.000	.000	.000	.000	.333	.000	.000	.333	.000	.000	.000	.000	.000	.667

Intersection of Noria Rd & N 1500 Rd Afternoon Peak-Hours Sunny, Hot File Name : Noria & N 1500 -epm-truck Site Code : 1 Start Date : 7/11/2012 Page No : 1

									Grou	ps Printed-	Unshifte	ed									
			Plant Drive rom North					1500 Rd rom East					Voria Rd					1500 Rd rom West			
Ctort Time	Diaht	Thru			Ann. Tatal	Diabt				Ann. Tatal	Diabt	Thru	om South	-	Aug. Tatal	Disht		Left		Aux Tatal	Int Total
Start Time	Right		Left		App. Total	Right	Thru	Left		App. Total	Right		Left		App. Total	Right	Thru			App. Total	Int. Total
02:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
*** BREAK ***																					
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
*** BREAK ***					I					I					I					I	
Total	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
03:00 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
*** BREAK ***															1					1	
03:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
03:45 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Total	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	9
04:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
*** BREAK ***					I					I					I					I	
04:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	5
Grand Total	0	9	0	0	9	0	0	0	0	0	0	7	0	0	7	1	0	0	0	1	17
Apprch %	0	100	0	0		0	0	0	0		0	100	0	0		100	0	0	0		
Total %	0	52.9	0	0	52.9	0	0	0	0	0	0	41.2	0	0	41.2	5.9	0	0	0	5.9	

Intersection of Noria Rd & N 1500 Rd Afternoon Peak-Hours Sunny, Hot File Name : Noria & N 1500 -epm-truck Site Code : 1 Start Date : 7/11/2012 Page No : 2

			Plant Dr	,				N 1500 R					Noria R					N 1500 R			
		F	rom Nor	In				From Eas	5l			F	rom Sou	un			1	From Wes	si		
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
Peak Hour Analysis Fro	om 02:00 P	M to 04:45	PM - Peak	1 of 1																	
Peak Hour for Entire In	tersection E	Begins at 03	8:00 PM																		
03:00 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
03:15 PM 03:30 PM	0	0 1	0	0	0 1	0	0	0	0	0	0	0	0	0	2 0 2	0	0	0	0	0	3 0 3
03:45 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Total Volume	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	9
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.625	.000	.000	.625	.000	.000	.000	.000	.000	.750

Intersection of Noria Rd & DG CO 442 Morning Peak-Hours Sunny, Hot File Name : CR 442 & Noria-eam-truck Site Code : 2 Start Date : 7/12/2012 Page No : 1

										ps Printed	- Unshifte										_
			Noria Rd					G CO 442					loria Rd				-				
			rom North	<u> </u>			F	rom East					om South				Fr	om West			ļ
Start Time		Thru	Left		App. Total	Right		Left		App. Total	Right	Thru			App. Total					App. Total	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
*** BREAK ***																					
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
06:45 AM	0	0	1	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
Total	0	0	1	0	1	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	8
07:00 AM	0	0	3	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
07:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	2
07:45 AM	0	0	1	0	1	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	4
Total	0	0	4	0	4	0	0	2	0	2	1	5	0	0	6	0	0	0	0	0	12
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
08:15 AM	0	1	4	0	5	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	9
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
Total	0	1	4	0	5	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	15
Grand Total	0	1	9	0	10	0	0	2	0	2	1	22	0	0	23	0	0	0	0	0	35
Apprch %	0	10	90	0		0	0	100	0		4.3	95.7	0	0		0	0	0	0		
Total %	0	2.9	25.7	0	28.6	0	0	5.7	0	5.7	2.9	62.9	0	0	65.7	0	0	0	0	0	l

Intersection of Noria Rd & DG CO 442 Morning Peak-Hours Sunny, Hot File Name : CR 442 & Noria-eam-truck Site Code : 2 Start Date : 7/12/2012 Page No : 2

			Noria Ro rom Nor					DG CO 44 From Eas					Noria Ro rom Sou				F	From We	st		
Start Time		Thru	Left		App. Total	Right		Left		App. Total	Right	Thru			App. Total					App. Total	Int. Total
Peak Hour Analysis Fr	om 06:00 Al	M to 08:45	AM - Peak	1 of 1			I														
Peak Hour for Entire In	ntersection E	Begins at 07	:30 AM																		
07:30 AM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	2
07:45 AM	0	0	1	0	1	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
08:15 AM	0	1	4	0	5	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	9
Total Volume	0	1	5	0	6	0	0	2	0	2	0	10	0	0	10	0	0	0	0	0	18
% App. Total	0	16.7	83.3	0		0	0	100	0		0	100	0	0		0	0	0	0		
PHF	.000	.250	.313	.000	.300	.000	.000	.500	.000	.500	.000	.625	.000	.000	.625	.000	.000	.000	.000	.000	.500

Intersection of DG CO 442 & Noria Rd Afternoon Peak-Hours Sunny, Hot File Name : CR 442 & Noria-epm-truck Site Code : 2 Start Date : 7/12/2012 Page No : 1

									Group	s Printed	- Unshifte	ed									
			loria Road					G CO 442					oria Road				Г.				1
Chart Times		Thru	rom North	ו	A	Dialat	1	rom East		A	Dialah		om Souti	n			Fr	om Wes	τ	A	Lat Tatal
Start Time			Left		App. Total	Right		Left		App. Total	Right	Thru			App. Total					App. Total	Int. Total
02:00 PM	0	0	4	0	4	0	0	I	0	1	0	0	0	0	0	0	0	0	0	0	5
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	4
02:30 PM	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
02:45 PM	0	1	3	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
Total	0	2	8	0	10	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	17
																					1
03:00 PM	0	1	2	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
03:15 PM	0	0	1	0	1	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	4
03:30 PM	0	0	3	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
03:45 PM	0	1	4	0	5	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	7
Total	0	2	10	0	12	2	0	0	0	2	0	7	0	0	7	0	0	0	0	0	21
I					I					I					I						
04:00 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
04:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	5	0	6	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	7
		-																			1
Grand Total	0	5	23	0	28	2	0	1	0	3	0	14	0	0	14	0	0	0	0	0	45
Apprch %	0	17.9	82.1	0	(0.0	66.7	0	33.3	0	(-	0	100	0	0		0	0	0	0		1
Total %	0	11.1	51.1	0	62.2	4.4	0	2.2	0	6.7	0	31.1	0	0	31.1	0	0	0	0	0	

Intersection of DG CO 442 & Noria Rd Afternoon Peak-Hours Sunny, Hot File Name : CR 442 & Noria-epm-truck Site Code : 2 Start Date : 7/12/2012 Page No : 2

		Ν	loria Ro	ad			[DG CO 4	42			I	Noria Ro	ad							
		F	rom No	rth				From Ea	st			F	From Sou	uth			I	From We	st		
Start Time		Thru	Left		App. Total	Right		Left		App. Total	Right	Thru			App. Total					App. Total	Int. Total
Peak Hour Analysis Fr	om 02:00 Pl	M to 04:45	PM - Peak	1 of 1																	
Peak Hour for Entire In	itersection E	Begins at 03	3:00 PM																		
03:00 PM	0	1	2	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
03:15 PM	0	0	1	0	1	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	4
03:30 PM	0	0	3	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
03:45 PM	0	1	4	0	5	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	7
Total Volume	0	2	10	0	12	2	0	0	0	2	0	7	0	0	7	0	0	0	0	0	21
% App. Total	0	16.7	83.3	0		100	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.500	.625	.000	.600	.500	.000	.000	.000	.500	.000	.583	.000	.000	.583	.000	.000	.000	.000	.000	.750

Intersection of CO Rd 442 & CO Rd 1057 Morning Peak-Hours Sunny, Hot Other: File Name : CR 442 & CR 1057-eam-truck Site Code : 3 Start Date : 7/17/2012 Page No : 1

										ps Printed	- Unshift										
			E 1900 Rd					G CO 442					G CO 105					G CO 442			
Start Time	Right	Thru	rom North Left		Ann Total	Right	Thru	rom East Left		Ann Total	Right	Thru	om South Left	1	Ann Tatal	Right	Thru	rom West		Ann Total	Int. Total
06:00 AM	-			0	App. Total	-				App. Total	-			0	App. Total	Right 3			0	App. Total	ini. Totai 3
	0	0	0			0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4
06:45 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	0	0	3	4
Total	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	11	0	0	0	11	12
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
*** BREAK ***					I																
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	4	0	0	0	4	5
08:15 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	4
08:30 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	2	0	0	0	2	6
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
Total	0	0	0	0	0	0	0	0	0	0	9	0	0	0	9	8	0	0	0	8	17
	_	_	_	_	- 1		_		_				_	_				_	_		
Grand Total	0	0	0	0	0	0	0	1	0	1	9	0	0	0	9	25	0	0	0	25	35
Apprch %	0	0	0	0		0	0	100	0		100	0	0	0	05.7	100	0	0	0	74 .	
Total %	0	0	0	0	0	0	0	2.9	0	2.9	25.7	0	0	0	25.7	71.4	0	0	0	71.4	

Intersection of CO Rd 442 & CO Rd 1057 Morning Peak-Hours Sunny, Hot Other: File Name : CR 442 & CR 1057-eam-truck Site Code : 3 Start Date : 7/17/2012 Page No : 2

			E 1900 F	?d			[DG CO 44	2			D	G CO 10	57			[DG CO 44	42		
		F	From No	rth			I	From Eas	st			F	rom Sou	ıth			F	From We	st		
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
Peak Hour Analysis Fro	om 06:00 A	M to 08:45	AM - Peak	1 of 1			1														
Peak Hour for Entire In	tersection E	Begins at 0	7:45 AM																		
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	4	0	0	0	4	5
08:15 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	4
08:30 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	2	0	0	0	2	6
Total Volume	0	0	0	0	0	0	0	0	0	0	9	0	0	0	9	8	0	0	0	8	17
% App. Total	0	0	0	0		0	0	0	0		100	0	0	0		100	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.563	.000	.000	.000	.563	.500	.000	.000	.000	.500	.708

Intersection of CO Rd 442 & CO Rd 1057 Afternoon Peak-Hours Sunny, Hot File Name : CR 442 & CR 1057-epm-truck Site Code : 3 Start Date : 7/17/2012 Page No : 1

										ps Printed	- Unshift										
			E 1900 Rd. rom North					G CO 442 rom East					G CO 105 om South					G CO 442 rom West			
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
02:00 PM	0	0	0	0	лрр. тоtai 0	0	0	0	0	лрр. тоtai 0	2	0	0	0	2	1	0	0	0	7,pp. 10tal	3
02:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	1	0	5	3	0	0	0	3	8
02:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	4
02:45 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	0	0	5
Total	0	0	0	0	0	0	0	0	0	0	15	0	1	0	16	4	0	0	0	4	20
03:00 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	4	0	0	0	4	7
03:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	1	0	0	0	1	5
03:30 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	0	0	5
03:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	3	0	0	0	3	5
Total	0	0	0	0	0	0	0	0	0	0	14	0	0	0	14	8	0	0	0	8	22
04:00 PM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	4	0	0	0	4	10
04:15 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	0	1	6
04:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	2	1	0	0	3	6
04:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	3
Total	0	0	0	0	0	0	0	0	0	0	16	0	1	0	17	7	1	0	0	8	25
Grand Total	0	0	0	0	0	0	0	0	0	0	45	0	2	0	47	19	1	0	0	20	67
Apprch %	0	0	0	0		0	0	0	0		95.7	0	4.3	0		95	5	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	67.2	0	3	0	70.1	28.4	1.5	0	0	29.9	

Intersection of CO Rd 442 & CO Rd 1057 Afternoon Peak-Hours Sunny, Hot File Name : CR 442 & CR 1057-epm-truck Site Code : 3 Start Date : 7/17/2012 Page No : 2

			E 1900 R From Nor					OG CO 44 From Eas					G CO 10 rom Sou					DG CO 44 From Wes			
Start Time	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Right	Thru	Left		App. Total	Int. Total
Peak Hour Analysis Fr	om 02:00 Pl	M to 04:45	PM - Peak	1 of 1																	
Peak Hour for Entire In	ntersection E	Begins at 03	3:45 PM																		
03:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	3	0	0	0	3	5
04:00 PM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	4	0	0	0	4	10
04:15 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	0	1	6
04:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	2	1	0	0	3	6
Total Volume	0	0	0	0	0	0	0	0	0	0	15	0	1	0	16	10	1	0	0	11	27
% App. Total	0	0	0	0		0	0	0	0		93.8	0	6.2	0		90.9	9.1	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.625	.000	.250	.000	.667	.625	.250	.000	.000	.688	.675

Interchange of K-10 & E 1900 Rd (North Ramps) Morning Peak-Hours Sunny, warm File Name : K10-N Ramps-eam-truck Site Code : 4 Start Date : 7/12/2012 Page No : 1

										os Printed-	Unshift	ed									
		E 1900 R	d / DG om Noi		'			WB Off				E 1900 F	Rd / DG (rom Sou		,			VB On R om Wes			
Chard Times	Dista					Dista		rom Eas					-				FI	om wes	ι –		
Start Time	Right	Thru		trucks	App. Total	Right	Thru	Left	trucks	App. Total		Thru	Left	trucks	App. Total					App. Total	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																					
Total	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
07:00 AM	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
*** BREAK ***																					
07:30 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4
07:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	4
Total	0	0	0	7	7	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	12
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	4
08:15 AM	0	0	0	3	3	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	8
08:30 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4
08:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
Total	0	0	0	6	6	0	0	0	0	0	0	0	0	12	12	0	0	0	0	0	18
Grand Total	0	0	0	13	13	0	0	0	1	1	0	0	0	17	17	0	0	0	0	0	31
Apprch %	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	0		
Total %	0	0	0	41.9	41.9	0	0	0	3.2	3.2	0	0	0	54.8	54.8	0	0	0	0	0	

Interchange of K-10 & E 1900 Rd (North Ramps) Morning Peak-Hours Sunny, warm File Name : K10-N Ramps-eam-truck Site Code : 4 Start Date : 7/12/2012 Page No : 2

				CO 105	7			(WB Off	17					CO 1057	1			(WB On			
			From No	rtn			1	From Ea	st			F	rom Sou	Jin				From We	St		
Start Time	Right	Thru		trucks	App. Total	Right	Thru	Left	trucks	App. Total		Thru	Left	trucks	App. Total					App. Total	Int. Total
Peak Hour Analysis Fro	om 06:00 A	M to 08:45	AM - Peak	1 of 1																	
Peak Hour for Entire In	ntersection E	Begins at 0	7:30 AM																		
07:30 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4
07:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	4
08:15 AM	0	0	0	3	3	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	8
Total Volume	0	0	0	6	6	0	0	0	0	0	0	0	0	14	14	0	0	0	0	0	20
% App. Total	0	0	0	100		0	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000	.700	.700	.000	.000	.000	.000	.000	.625

Interchange of K-10 & E 1900 Rd (N Ramps) Afternoon Peak-Hours Sunny, Hot File Name : K10-N Ramps-epm-truck Site Code : 4 Start Date : 7/17/2012 Page No : 1

										ps Printed	Unshift										_
		E 1900 R Fro	d / DG om Nor		/			WB Off rom Ea				E 1900 F Fr	Rd / DG (om Sou		7			NB On R			
Start Time	Right	Thru		trucks	App. Total	Right	Thru	Left	trucks	App. Total		Thru		trucks	App. Total				-	App. Total	Int. Total
02:00 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	5
02:15 PM	0	0	0	3	3	0	0	0	1	1	0	0	0	3	3	0	0	0	0	0	7
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	5
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	4
Total	0	0	0	5	5	0	0	0	1	1	0	0	0	15	15	0	0	0	0	0	21
03:00 PM	0	0	0	4	4	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	8
03:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	4
03:30 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	5	5	0	0	0	0	0	6
03:45 PM	0	0	0	3	3	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	5
Total	0	0	0	8	8	0	0	0	1	1	0	0	0	14	14	0	0	0	0	0	23
04:00 PM	0	0	0	5	5	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	9
04:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	6
04:30 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	6
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
Total	0	0	0	8	8	0	0	0	0	0	0	0	0	15	15	0	0	0	0	0	23
Grand Total	0	0	0	21	21	0	0	0	2	2	0	0	0	44	44	0	0	0	0	0	67
Apprch %	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	0		
Total %	0	0	0	31.3	31.3	0	0	0	3	3	0	0	0	65.7	65.7	0	0	0	0	0	

Interchange of K-10 & E 1900 Rd (N Ramps) Afternoon Peak-Hours Sunny, Hot File Name : K10-N Ramps-epm-truck Site Code : 4 Start Date : 7/17/2012 Page No : 2

			Rd / DG From No	CO 105 rth	7			(WB Off From Ea	Ramp) st				Rd / DG rom Sou	CO 105 [°] uth	7			(WB On From We			
Start Time	Right	Thru		trucks	App. Total	Right	Thru	Left	trucks	App. Total		Thru	Left	trucks	App. Total					App. Total	Int. Total
Peak Hour Analysis Fr	om 02:00 P	M to 04:45	PM - Peak	1 of 1			1														
Peak Hour for Entire Ir	ntersection I	Begins at 0	3:30 PM																		
03:30 PM	0	0	0	0	0	0	0	0			0	0	0			0	0	0	0	0	6
03:45 PM	0	0	0	3	3	0	0	0	1	1	0	0	0	5	5	0	0	0	0	0	5
04:00 PM	0	0	0	5	5	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	9
04:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	6
Total Volume	0	0	0	9	9	0	0	0	1	1	0	0	0	16	16	0	0	0	0	0	26
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.450	.450	.000	.000	.000	.250	.250	.000	.000	.000	.800	.800	.000	.000	.000	.000	.000	.722

Interchange of K-10 & E 1900 Rd (South Ramps) Morning Peak-Hours Sunny, Warm File Name : K10-S Ramps-eam-truck Site Code : 4 Start Date : 7/12/2012 Page No : 1

										ps Printed	- Unshift	ed									
		E 1900			7			EB On R				E 1900 R			/			EB Off I			
			rom No					rom Eas	t				om Sout					rom We	1		
Start Time		Thru	Left	trucks	App. Total					App. Total	Right	Thru		trucks	App. Total	Right	Thru	Left	trucks	App. Total	Int. Total
*** BREAK ***																					
07:00 AM	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
*** BREAK ***					1					1					1						
07:30 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4
07:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	4
Total	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	12
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
08:15 AM	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	8
08:30 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12	17
					. 1																
Grand Total	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	17	17	29
Apprch %	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	100		
Total %	0	0	0	41.4	41.4	0	0	0	0	0	0	0	0	0	0	0	0	0	58.6	58.6	

Interchange of K-10 & E 1900 Rd (South Ramps) Morning Peak-Hours Sunny, Warm File Name : K10-S Ramps-eam-truck Site Code : 4 Start Date : 7/12/2012 Page No : 2

				CO 1057	7			(EB On F						CO 1057	1			(EB Off			
		ŀ	rom No	rtn				From Eas	st			F	rom Sou	uth			ł	From We	est		
Start Time		Thru	Left	trucks	App. Total					App. Total	Right	Thru		trucks	App. Total	Right	Thru	Left	trucks	App. Total	Int. Total
Peak Hour Analysis Fro	om 06:00 Al	VI to 08:45	AM - Peak	1 of 1																	
Peak Hour for Entire In	tersection E	Begins at 07	:30 AM																		
07:30 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4
07:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
08:15 AM	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	8
Total Volume	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	14	14	20
% App. Total	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.700	.700	.625

Interchange of K-10 & E 1900 Rd (S Ramps) Afternoon Peak-Hours Sunny, Hot File Name : K10-S Ramps-epm-truck Site Code : 4 Start Date : 7/17/2012 Page No : 1

										ps Printed	- Unshifte	ed									
) / DG C rom Noi					(EB On R From Eas					/ DG C om Sou					EB Off I rom We			
Start Time		Thru	Left	trucks	App. Total					App. Total	Right	Thru		trucks	App. Total	Right	Thru	Left	trucks	App. Total	Int. Total
02:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	4
02:15 PM	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	5
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
Total	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	15	15	19
03:00 PM	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8
03:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	4
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	5
03:45 PM	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	5
Total	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	14	14	22
04:00 PM	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	9
04:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	6
04:30 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	6
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	15	15	23
Grand Total	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	44	44	64
Apprch %	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	100		
Total %	0	0	0	31.2	31.2	0	0	0	0	0	0	0	0	0	0	0	0	0	68.8	68.8	

Interchange of K-10 & E 1900 Rd (S Ramps) Afternoon Peak-Hours Sunny, Hot File Name : K10-S Ramps-epm-truck Site Code : 4 Start Date : 7/17/2012 Page No : 2

			0 / DG C rom No					(EB On F From Eas	1.7				0 / DG C rom Sou					(EB Off rom We			
Start Time		Thru	Left	trucks	App. Total					App. Total	Right	Thru		trucks	App. Total	Right	Thru	Left	trucks	App. Total	Int. Total
Peak Hour Analysis Fr	om 02:00 Pl	M to 04:45	PM - Peak	1 of 1			1														
Peak Hour for Entire In	itersection E	Begins at 03	:45 PM																		
03:45 PM	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	5
04:00 PM	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	9
04:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	6
04:30 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	6
Total Volume	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	15	15	26
% App. Total	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.550	.550	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750	.750	.722

APPENDIX IV

Crash History (Source: Douglas County)

APPENDIX V

Guidelines for Right-Turn & Left-Turn Treatments

at

Unsignalized Intersections

Report No. K-TRAN:KSU-95-5 Final Report

GUIDELINES FOR RIGHT-TURN TREATMENTS AT UNSIGNALIZED INTERSECTIONS AND DRIVEWAYS

Tanweer Hasan Robert W. Stokes Kansas State University Manhattan, Kansas



May 1996

K-TRAN

A COOPERATIVE TRANSPORTATION RESEARCH PROGRAM BETWEEN: KANSAS DEPARTMENT OF TRANSPORTATION THE KANSAS STATE UNIVERSITY THE UNIVERSITY OF KANSAS

Table 7.1 Right-turn treatment guidelines for two-lane highways.*

(Turning speed = 15 mph)

Roadway					Roadwa	iy Operat	ing Spec	ed (mph)				
DDHV	4	0	4	5	-	50	5	55	é	50	ć	5
(vph)	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper
200				83	73	30	35	14	20	8	15	7
300	and the second s		120	40	41	19	24	9	15	7	12	6
400	200	85	52	27	30	14	19	8	12	6	11	5
600	50	27	26	13	20	9	14	6	10	5	9	4
800	25.	12	16	8	15	7.	11	5	9	4	8	3
1000	14	8	12	5	11	5	9	4	8	3	7	3
1200	10	6	9	4.	9	4	8	4	7	3	7	3

* Minimum right-turn design hour volumes (vph) required to warrant right-turn treatments.

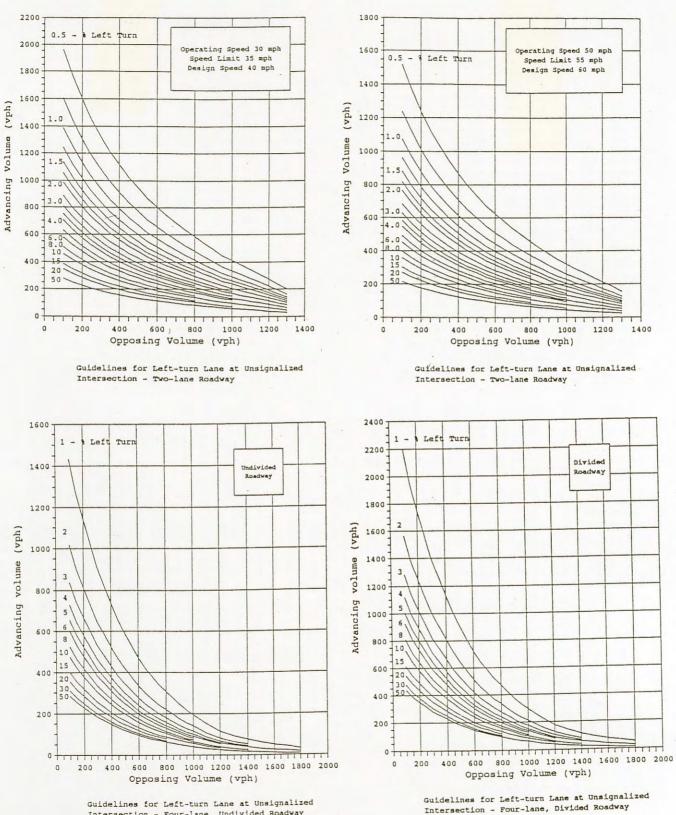
National Cooperative Highway Research Program

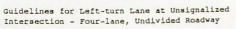
NCHRP Synthesis 225

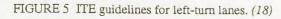
Left-Turn Treatments at Intersections

A Synthesis of Highway Practice

Transportation Research Board National Research Council a the Walter







and the state of the

Serving Comm	mities Through Excellence Ransas - Missouri - Michigan - California
	Memorandum RECEIVED
Date:	September 13 th , 2012 SEP 1 4 2012
To:	C.L. Maurer, RLA, ASLA Senior Landscape Architect Landplan Engineering, P.A.
From:	Mehrdad Givechi, PE, PTOE, <i>Mehrdad Givechi</i> Managing Principal MGineering Solutions
Re:	Penny Sand Plant Expansion, Addendum No. 1 Between Lawrence and Eudora, Douglas County, KS

This memo is prepared as an Addendum No. 1 to <u>Traffic Impact Study for "Penny Sand</u> <u>Plant Expansion"</u> dated 7/23/12 to re-evaluate impact of the traffic generated by this development, using the new information provided by the applicant as summarized in the following paragraphs:

- 1. The original TIS report dated 7/23/12 was prepared based on the "worst case scenario" when the proposed sand facility would potentially distribute approximately 5,000 tons of sand on a highly productive day (a very rare event). Based on the new information provided by the applicant, the primary reason for the proposed expansion of the plant (from 114 acres to 465 acres) is to switch over the sand excavation area from the river-side to the in-land side, maintaining its current rate of sand distribution at approximately 1,000(+/-) tons on an average day (based on most recent 7-year average) for foreseeable future. It is, however, to be noted that as the economy improves, a higher distribution rate will be likely as demand goes up with the absolute maximum rate of 5,000 tons a day (a very rare event) as described and studied in the original TIS dated 7/23/12.
- 2. As mentioned in the original TIS, N. 1500 Road has posted weight limit signs of 5 tons on both sides of Noria Road and is not a designated truck route. Currently, all



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site-generated trucks use Noria Road to access the site. Under the proposed development plan, all site-generated trucks will maintain the same route to access the site and will not be using N. 1500 Road.

3. The original TIS dated 7/23/12 states that, currently, the facility is staffed by 4 employees and no increase in the number of employees is anticipated. Based on the new information provided by the applicant, the number of current employees is 8 and expected to increase to 10.

Traffic Impact Reassessment

Using the average distribution rate of 1,000 tons/day following the same analogy mentioned in the original TIS, the estimated number of trucks serving the site will be around 40 trucks/day with 5 trucks/peak-hour - equivalent to 10 truck trip-ends/peak-hour (5 inbound and 5 outbound). Comparing this number to that generated by the existing sand plant (8 truck trip-ends, 4 inbound and 4 outbound) results in an increase of 2 truck trip-ends/peak-hour (1 inbound and 1 outbound) – a nominal increase in truck traffic, none of which will be impacting N. 1500 Road except at the access point to the site.

Using the ITE trip generation rates for the office component of the site (ITE Land Use Code 715) indicates that the increase in the number of employees (2 new people) will likely result in 2 new trip-ends (all passenger cars) during the peak-hour of a typical weekday – a nominal increase in passenger car traffic with insignificant impact on the roadway network.

Re-evaluation of the operating conditions of traffic in the study area, given the new information, indicates that, during the critical peak-hour of a typical weekday when the plant is operating under average conditions, the increase in the number of trucks and passenger cars is insignificant with nominal impact on the roadway network.

In light of the new information provided by the applicant and the traffic impact reassessment:

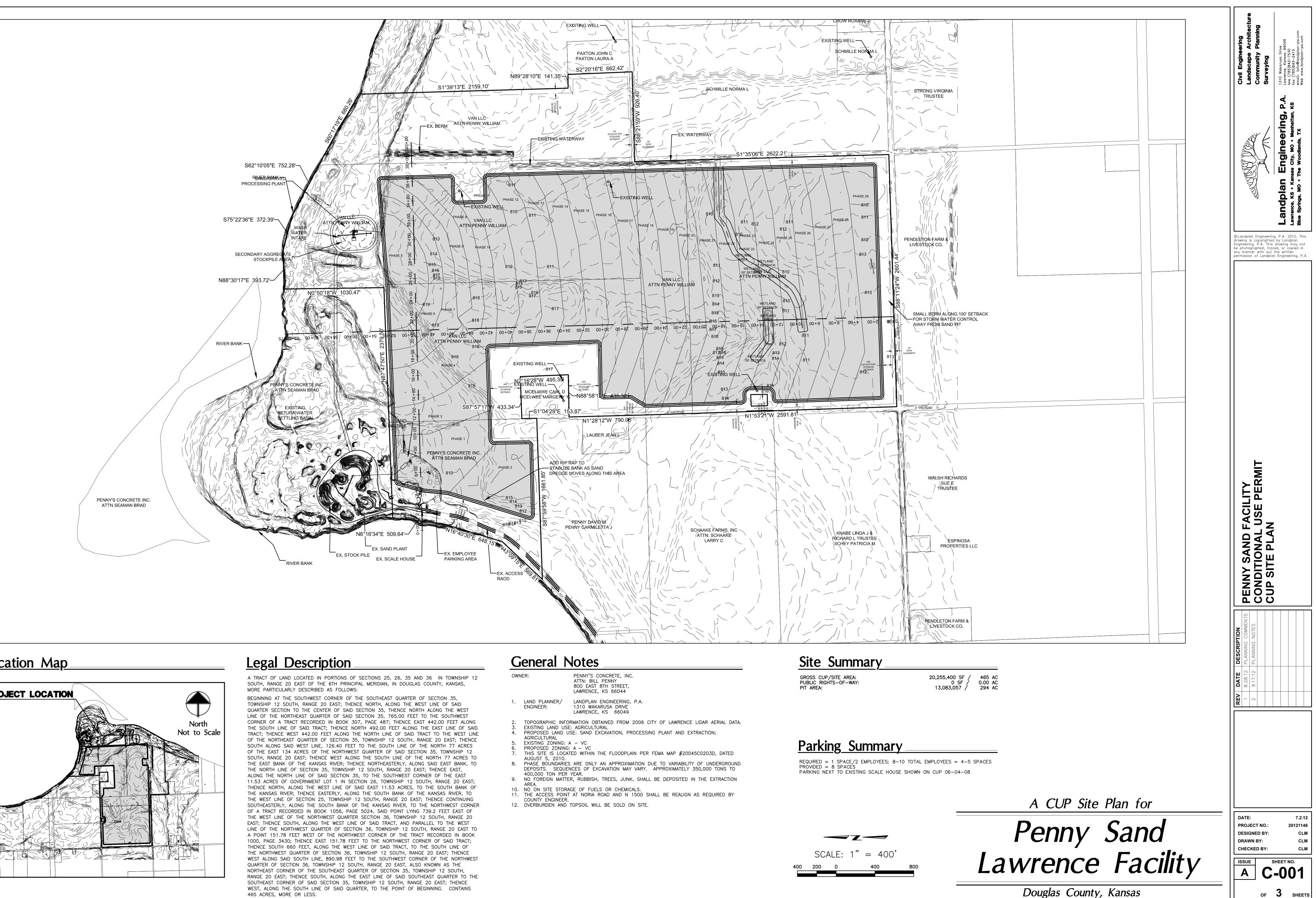
2



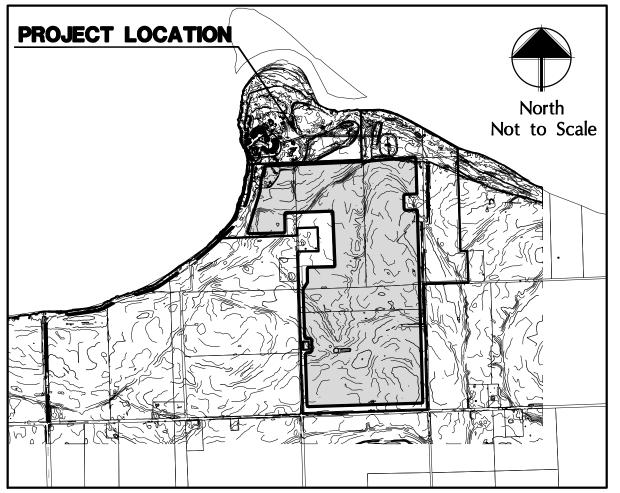
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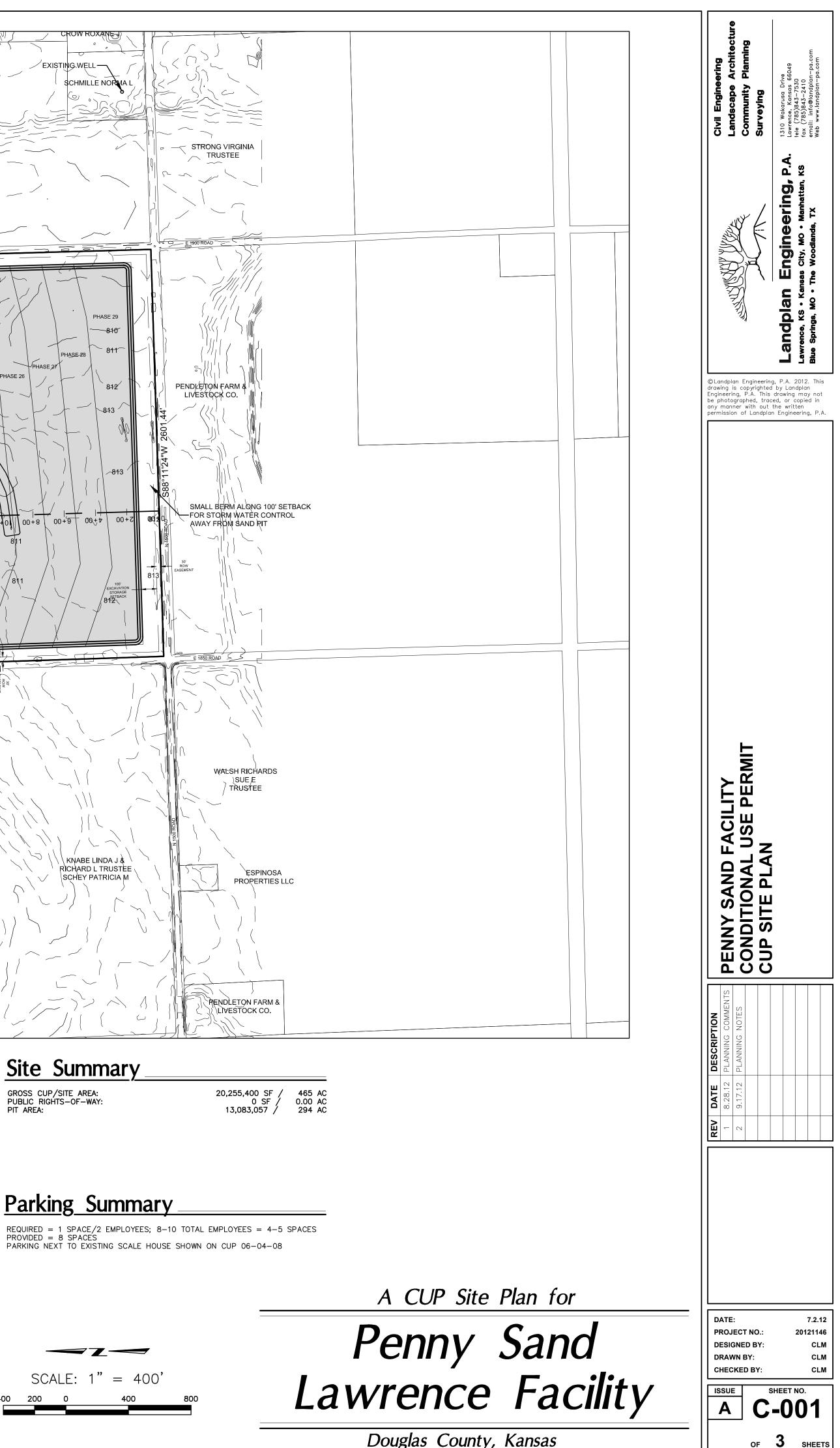
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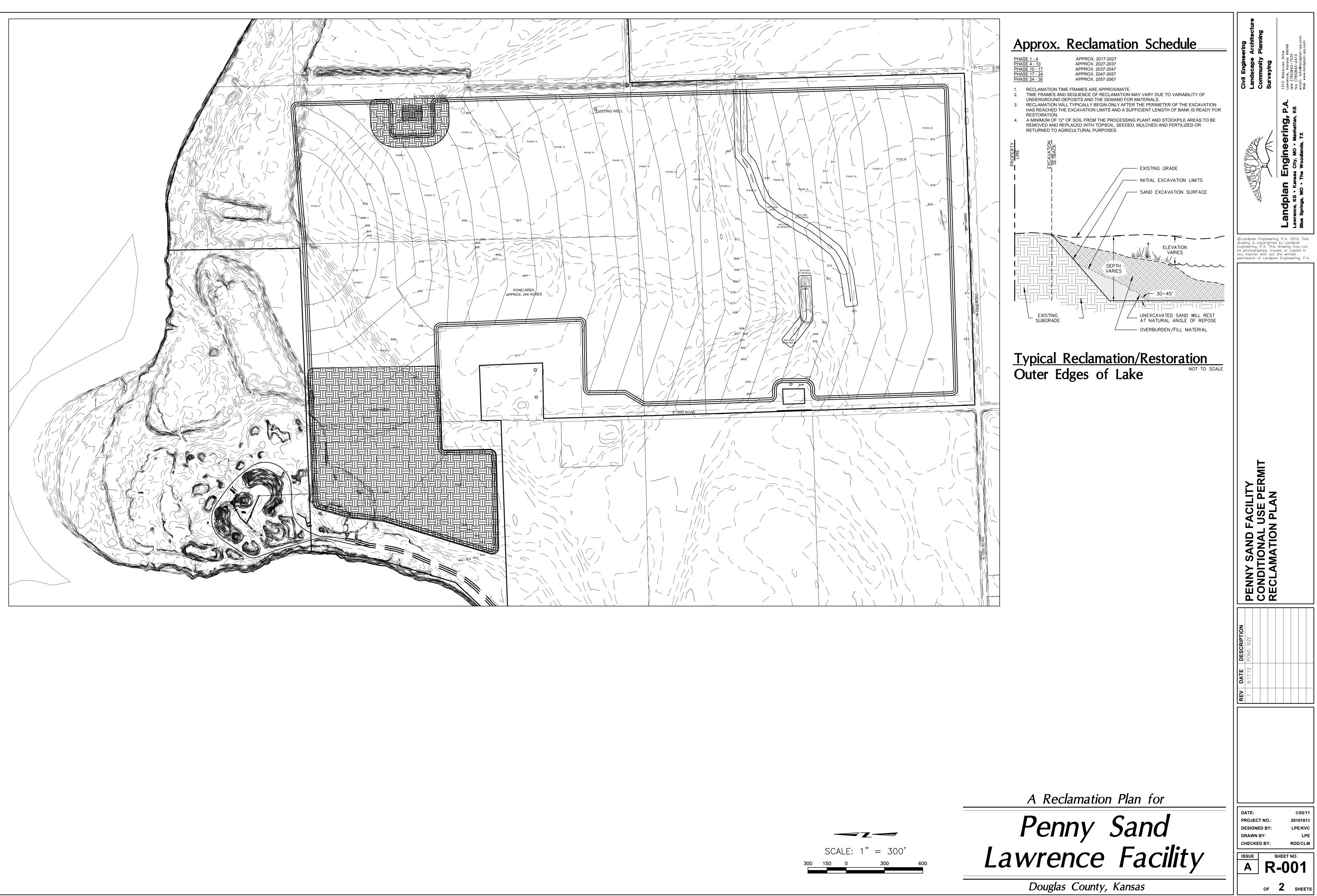
- 1. It is still desirable that 100' long section of the site access, just north of N. 1500 Road be paved as listed in the original TIS under improvement #1.
- 2. The need for a dedicated eastbound right-turn lane on Route 442 (Old K-10) at its intersection with Route 1057 (as listed under improvement #2 in the original TIS) becomes less relevant because the increase in truck traffic will be nominal for a foreseeable future. As time goes by and economy improves with higher demand for sand distribution, the increase in site-generated truck traffic should be studies to reassess the need for this turn lane.
- 3. As stated in the original TIS, under improvement #3, pavement conditions along certain segments of the roadway network should be evaluated to determine if they can withstand heavy truck loads. This was merely suggested based on a cursory visual field observation and is not the result of a formal pavement analysis and/or evaluation. It should be noted that pavement analysis and/or evaluation is beyond the scope of a typical traffic impact study.



Location Map







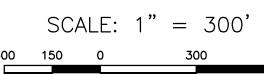


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GENERAL

With the current restrictions which The Corps of Engineers has placed on dredging sand from the Kansas River, many river dredging operations have had their permits suspended or restricted, and will be forced to terminate their dredging operations. Although the Kansas River is being restricted for the dredging of sand, the need for this raw material for construction and development continues. Throughout the river valley / river channel sand is one of the natural resources available for local mining.

Extraction Process

Overburden Removal: A location will be selected for the first stage of sand removal. This location is referenced on the Site Plan as Phase 1. Within this location, topsoil and overburden are removed to expose the sand deposit by means of appropriate earthmoving equipment. Overburden is defined as any earthen material lying above the aggregates. Topsoil and overburden will be used to grade the site as necessary. Excavation will be no closer than 50 feet from any property line. Overburden will be retained for use in reclamation with any excess materials stockpiled and available for resale.

Extraction: Excavation will continue until the water table is exposed. At this point, the material will be dredged from the pit, pumped to the processing plant.

Material Processing:

As sand is extracted, it is pumped to the plant for processing. Through plant processing, sand will be sorted by particle size and blended to make a quality product that can be used in concrete, asphalt, ice control, masonry, glass, insulation or specifications provided for a particular project.

The processing plant uses water from the excavated lake to wash sand over a series of screens separating the material into different classifications of material. The processing plant contains vibrating screens with various size of openings. After the material is sorted, these materials will be stockpiled via radial stackers or front end loaders. Pea gravel, river rock will also be stockpiled.

Water used during the operations will be diverted either to a sedimentation pond where solids suspended in these waters can settle out or in the event the material is of a coarser nature will return directly to the excavated lake.

With wet processing, we would expect minimal dust to be created during the process. Dust exposure is monitored by Mine Safety Health Administration to assure minimal risks to our employees and therefore also to surrounding areas.

Noise levels are monitored, as well, by MSHA for assurance the decibel levels do not exceed the safety standards.

Material Handling

Finished material is conveyed to stockpiles consisting of various grades fine aggregates. The primary stockpiles are generally 30-40 feet tall. Stockpiles will vary in height. The material will be transported by trucks. The trucks are loaded either by a conveyor / bin or a front end loader, weighed to assure the truck weight is approximately the requested weight or within the legal gross tagged weight, ticketed and then travel to their destination.

Existing access roads will be maintained to promote drainage thus preventing excessive erosion or tracking of mud onsite or offsite. The approximate location of existing access roads, stockpiles, scalehouse and main entrance are shown on the Site Plans.

Reclamation

Reclamation for an off-river dredging operation occurs over the entire lifespan of the operation as the excavated lake reaches its limits. Reclamation involves the restoration of the perimeter of the mining site, leaving a permanent body of water. The reclamation plan will include the placement of fill material along the bank to create a uniformly sloped and stabilized bank to create an area that can be vegetated and maintained. Reclamation plans must be submitted, approved and annually monitored by the State Conservation Commission.

Phased excavation schedules have been provided on the Site Plan. These schedules are approximations and will vary due to the economic demand, the variability of the deposits and the desire to maintain the current agriculture as long as feasibly possible. Similarly, an approximate reclamation schedule has been provided on the Reclamation Plan. Annual reporting to the State Conservation Commission monitors "affected" acreage and any changes to the reclamation plan.

Since reclamation is performed when the excavated lake has reached its limits for the specific phase, it is not uncommon for the first reclamation to occur up to 10 years following the beginning of the operation.

When extraction operations at this site are complete, the final reclamation will include the restoration of all remaining banks, the removal of the processing plant, scalehouse, scales and all other associated equipment and buildings from the site. The processing plant and stockpile areas may be returned to agricultural land or other uses that will be beneficial to the property or owner.

Local, State and Federal Requirements

Penny's will adhere to all applicable State and Federal Requirements / Regulations. Each required State and Federal permit for this project, will be obtained prior to the commencing of operations which the specific permit regulates. As these permits are obtained, copies will be submitted to the Douglas County Planning Department.

U.S. Army Corps of Engineers:

<u>Clean Waters Act</u> – The U.S. Army Corps of Engineers requires a Section 404 Permit for the discharge of dredged or fill materials into the Waters of the U.S. (regulated rivers, streams, lakes, wetland areas, etc.). This facility is an off-river operation and does not discharge into Waters of the U.S. An official wetland delineation has not been performed for this site. There exists potential wetland areas within the project boundaries, which have been delineated based on aerial photography and site visits. All operations are designed to have no impact on the potential wetland areas. A 50-foot buffer has been provided to ensure the project does not encroach upon potential wetland areas. Therefore, a permit application will not be filed with the U.S. Army Corps of Engineers as pertaining to Section 404 of the Clean Waters Act.

Excavation Near a Levee - There are no levees along the Kansas River near this project, therefore, there will be no excavation within the Critical Area of the levee and no permitting will be required.

Kansas Department of Agriculture – Division of Water Resources:

<u>Water Structures</u> – DWR Water Structures Section requires that, per K.A.R. 5-43-5 of the Rules and Regulations (K.S.A. 82a-012 to 305a), a minimum setback of 50 feet be maintained from the bank of a channel to any sand dredging operations located outside the channel of any stream. A natural riparian buffer currently exists between the northern boundary of the project and the Kansas River. The minimum width of this buffer is approximately 300 feet. The buffer is to remain intact undisturbed.

<u>Water Appropriation</u> - DWR Water Appropriation Section requires an Application for Approval to Change the Place of Use, The Point of Diversion or the Use Made of the Water under an Existing Water Right. There will be no new uses or change of uses of water rights associated with this project. DWR Water Appropriation Section requires permits for all sand and gravel pits in townships where the net average annual potential for net evaporation is greater than 18 inches per year. The potential net evaporation for this site is approximately 6 inches per year; therefore, this permit will not be required. DWR also requires a Notice of Intent to Open or Expand a Sand or Gravel Pit Operation. This NOI has been requested.

<u>Floodplain Management</u> - DWR Floodplain Management Section will require a permit for the placement of fill within the floodplain per K.A.R. 5-45 of the Rules and Regulations (K.S.A. 24-126). All permanent fills and unconsolidated mass storage stockpiles located within the floodway require approval from the Chief Engineer with 'no-rise' certification.

Kansas Department of Health and Environment:

<u>Stormwater and Erosion Protection</u> – An erosion control plan for construction will be filed with KDHE and a permit will be required under the Kansas General Permit for Stormwater Runoff Associated with Construction Activities. An application for permit will be filed following approval of the Conditional Use Permit.

Because of the industrial nature of the project, a permit will be required for all stormwater runoff originating from an industrial activity. Penny's will develop and implement a Stormwater Pollution Prevention Plan for the site, to be reviewed and approved by KDHE. An application for permit has been requested.

The predominance of stormwater from onsite will drain back into the water body created by the extraction process. Stormwater from offsite shall be conveyed to the existing wetland areas, as occurs in the existing condition, and will only be allowed to enter the excavation pond during flooding events.

<u>Water</u> – Currently Penny's is permitted for an onsite well used for irrigation. When it is time for the plugging or elimination of this well, the KDHE Bureau of Water – Geology Section will be contacted and the proper paperwork will be filed.

<u>Fugitive Dust</u> – Penny's will utilize water trucks and apply dust suppressants to control fugitive dust within the site as needed. However, since the product processed in this operation is drawn from a body of water, the typical need for dust suppressant in minimal.

State Conservation Commission:

<u>Mining Permit/License</u> – The proposed site is subject to the "Surface Mined Land Conservation and Reclamation Act", K.S.A. 49-602 *et seq.* Penny's holds License No. 95-064, which must be renewed annually. The current license expires December 31, 2012.

<u>Mine Registry</u> - As required by State law, this site will be registered with the SCC prior commencing with the mining process. Penny's will file an application to register the site as a mine site with the SCC following approval of the CUP.

<u>Reclamation Bonding</u> – As required by State law, license holders are required to post a bond or other acceptable financial security to the SCC and a Reclamation Plan, detailing the post-mining land use and the reclamation process, must be filed and approved by the SCC prior to any mining taking

place on the proposed mine. The bond application / letter of credit will be filed with the SCC upon approval of the CUP.

Department of Wildlife and Parks:

<u>Action Permit</u> – A request will be made to the Kansas Department of Wildlife and Parks for an environmental review of the site for potential endangered species or critical habitats. Based on the findings of the review, the need for an action permit will be determined. KDWP may also request additional review from the Department of the Interior or the U.S. Fish and Wildlife Service.

Environmental Protection Agency:

Spill Prevention, Control and Countermeasure Plan – Penny's may maintain a fuel tank for fueling loaders used for the loading of sand into trucks. Fuel for the dredge will not be stored onsite. Fueling of the dredge will be performed by fuel stored offsite. Other fuel or petroleum-based products used for generators or maintenance will occur in amounts smaller than 55 gallons, which is the minimum container size that that is required to be documented in an SPCC Plan. Overall, the amount of petroleum-based materials stored at this site will not exceed the levels (1,320 gallons) required by the EPA for implementing an SPCC Plan.

Operation Times: Typically hours of operation would be Monday – Friday 6:30 AM – 6:30 PM. There may be extenuating circumstances which would require Penny's to maintain operating hours on Saturdays or to extend the normal hours of operation due to the nature of the construction business. Many clients, including State agencies and City governments require construction activities to be completed at odd hours for the safety of the general public. Weather conditions and / or the necessity to provide materials for the hazardous conditions as it relates to snow and ice to state and local agencies may also result in the need to extend hours of operation. Projects / contracts may have such stringent completion dates and / or penalties for exceeding working days it would necessitate the extension of hours of operation.

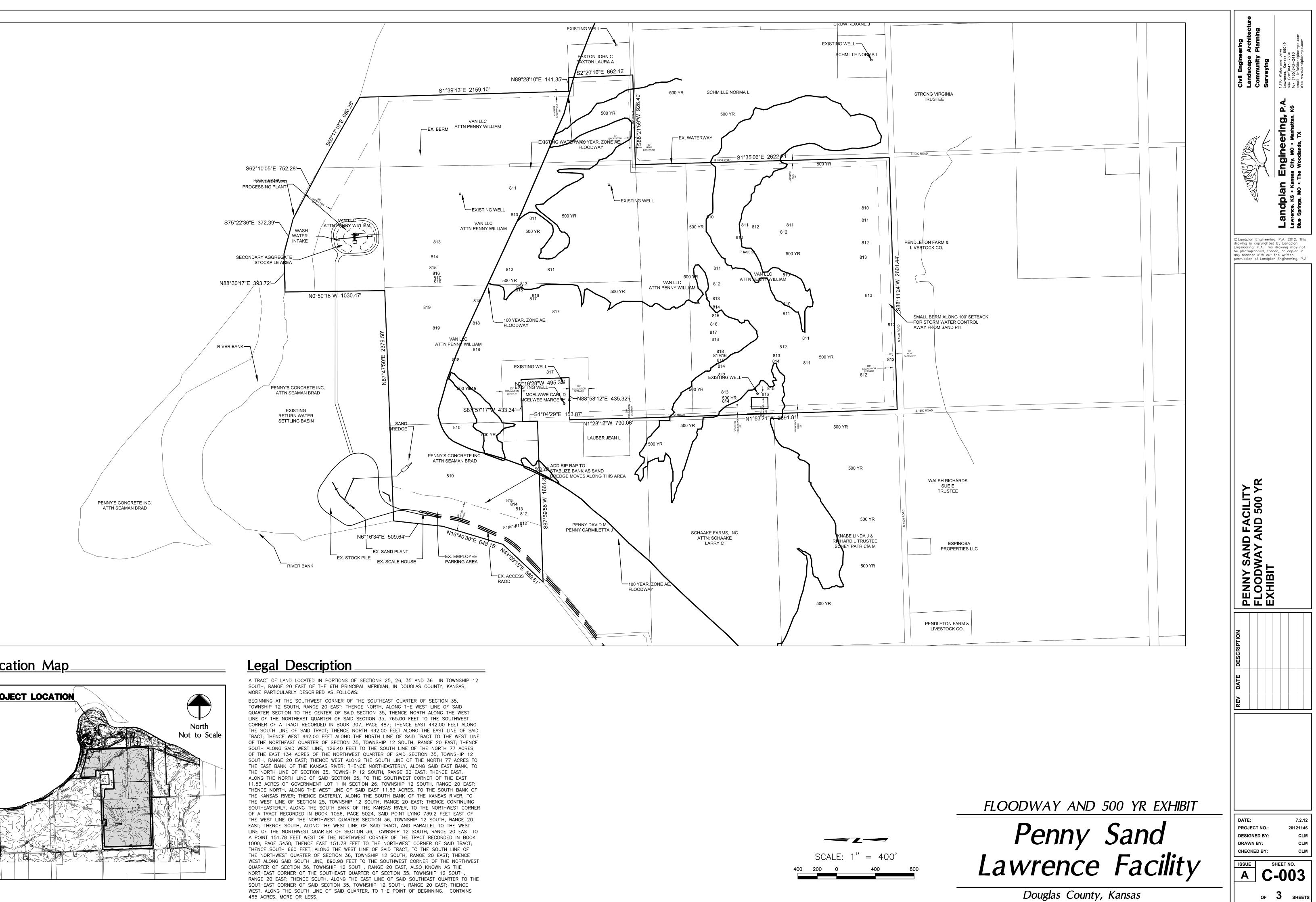
Overburden Placement: During the initial stage of the operation, overburden removed from the excavation area will be used in raising the grade of the processing plant and scalehouse areas and for berms as required. As the excavated lake pond expands into future stages, overburden will be stockpiled at locations deemed beneficial to the reclamation effort, sold, or used to restore the banks of the body of water established by the previous stages.

Operation Life Expectancy: Based upon current economic conditions, the expected life of this project would be 30+ years.

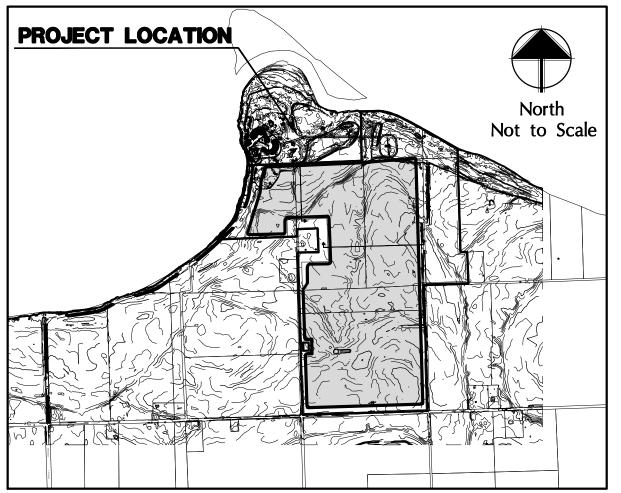
Plan of Response to a Major Flooding Event: Penny's will prepare a plan of action, which would be implemented immediately upon notification that a flood event may occur. The plan will include the removal of all equipment, materials and bulk fuel that is not stationary. The scalehouse, scales and processing plant will remain. Non-stationary items that will be removed will include, but are not limited to, loaders, vehicles, fuel supplies, generators, and any electronic equipment or office materials in the scalehouse.

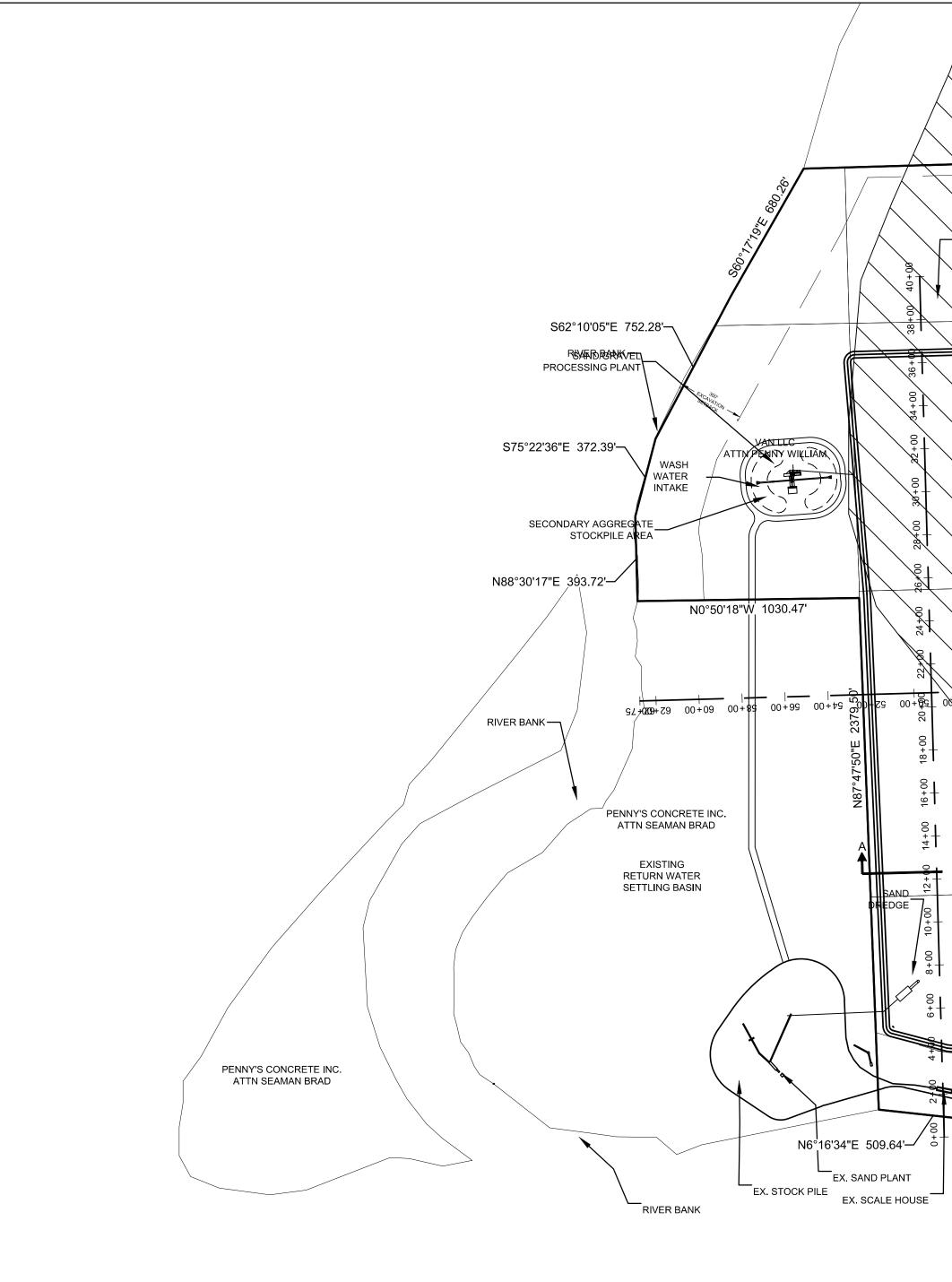
Power and Fuel Supply: The scalehouse and processing plant will be electrically powered by the Westar Energy lines. The dredge will be diesel-powered. The site fuel supply for the loader and/or generators will be limited to 1,000 gallons. The fuel will be stored in an aboveground storage tank with secondary containment. The fuel pump will be controlled with a power switch located within the scalehouse. The pump will be turned off during non-business hours. Dredge fueling will be performed by fuel from offsite.

Stormwater Runoff: All stormwater falling around the scalehouse, processing plant or stockpiles will be kept on site. The site will be completely non-discharging, with no stormwater leaving the site. Stormwater from offsite shall be conveyed to the existing wetland areas, as occurs in the existing condition, and will only be allowed to enter the excavated lake during flooding events. Any increases in stormwater runoff due the increased impervious surfaces will be substantially offset by the storage capabilities of the excavated lake.

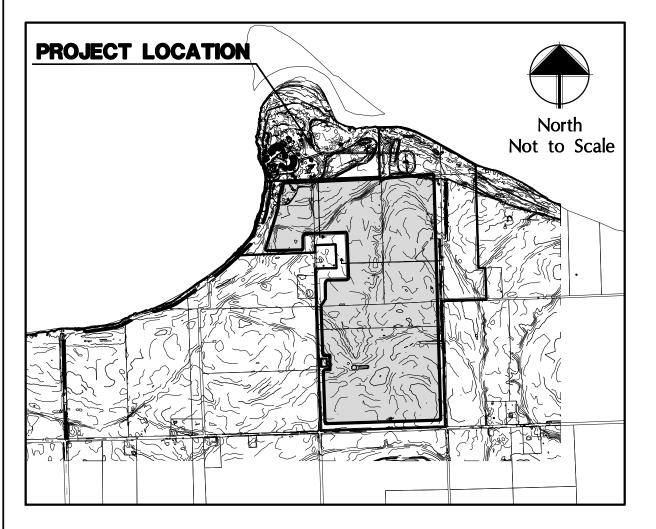


Location Map





Location Map



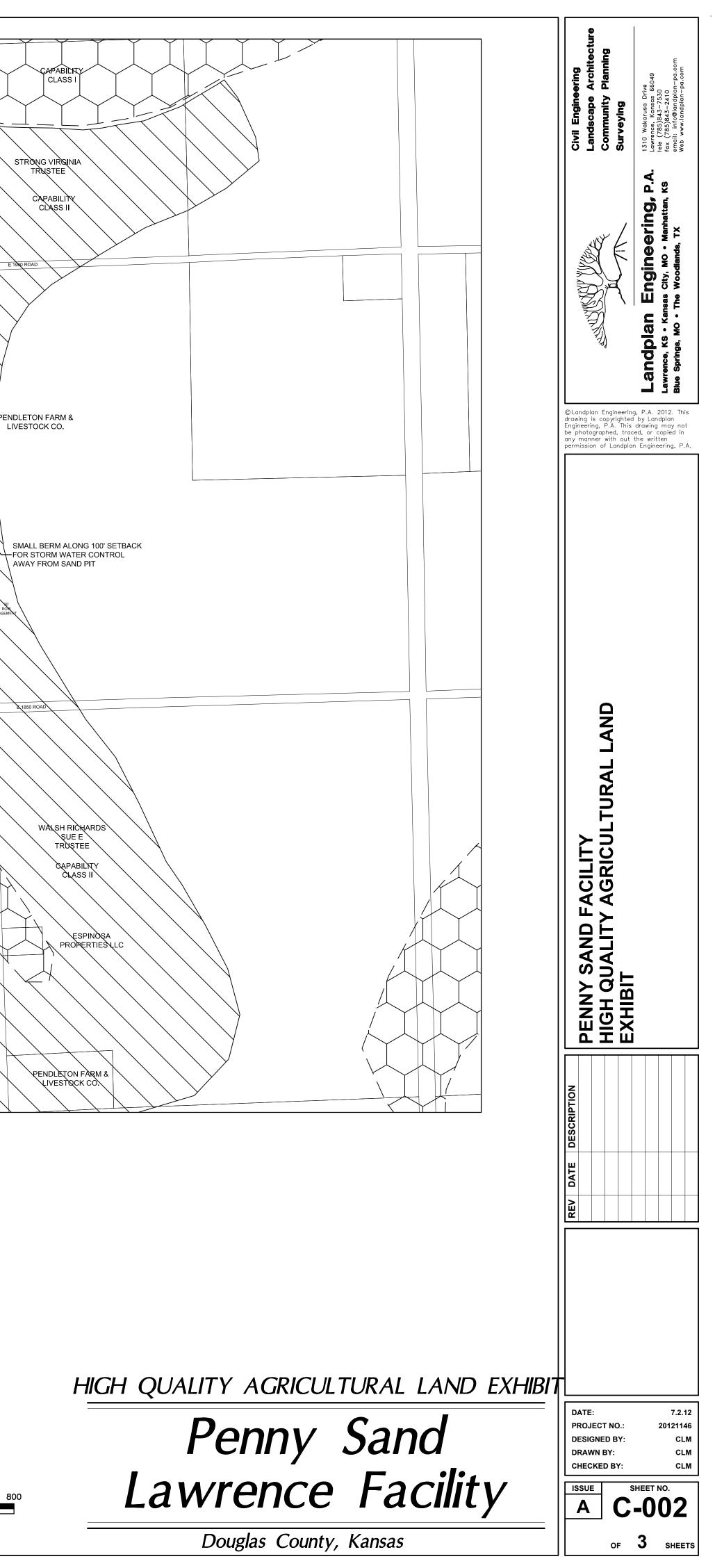
Legal Description

A TRACT OF LAND LOCATED IN PORTIONS OF SECTIONS 25, 26, 35 AND 36 IN TOWNSHIP 12 SOUTH, RANGE 20 EAST OF THE 6TH PRINCIPAL MERIDIAN, IN DOUGLAS COUNTY, KANSAS, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF THE SOUTHEAST QUARTER OF SECTION 35, TOWNSHIP 12 SOUTH, RANGE 20 EAST; THENCE NORTH, ALONG THE WEST LINE OF SAID QUARTER SECTION TO THE CENTER OF SAID SECTION 35, THENCE NORTH ALONG THE WEST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 35, 765.00 FEET TO THE SOUTHWEST CORNER OF A TRACT RECORDED IN BOOK 307, PAGE 487; THENCE EAST 442.00 FEET ALONG THE SOUTH LINE OF SAID TRACT; THENCE NORTH 492.00 FEET ALONG THE EAST LINE OF SAID TRACT; THENCE WEST 442.00 FEET ALONG THE NORTH LINE OF SAID TRACT TO THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 35, TOWNSHIP 12 SOUTH, RANGE 20 EAST; THENCE SOUTH ALONG SAID WEST LINE, 126.40 FEET TO THE SOUTH LINE OF THE NORTH 77 ACRES OF THE EAST 134 ACRES OF THE NORTHWEST QUARTER OF SAID SECTION 35, TOWNSHIP 12 SOUTH, RANGE 20 EAST; THENCE WEST ALONG THE SOUTH LINE OF THE NORTH 77 ACRES TO THE EAST BANK OF THE KANSAS RIVER; THENCE NORTHEASTERLY, ALONG SAID EAST BANK, TO THE NORTH LINE OF SECTION 35, TOWNSHIP 12 SOUTH, RANGE 20 EAST; THENCE EAST, ALONG THE NORTH LINE OF SAID SECTION 35, TO THE SOUTHWEST CORNER OF THE EAST 11.53 ACRES OF GOVERNMENT LOT 1 IN SECTION 26, TOWNSHIP 12 SOUTH, RANGE 20 EAST; THENCE NORTH, ALONG THE WEST LINE OF SAID EAST 11.53 ACRES, TO THE SOUTH BANK OF THE KANSAS RIVER; THENCE EASTERLY, ALONG THE SOUTH BANK OF THE KANSAS RIVER, TO THE WEST LINE OF SECTION 25, TOWNSHIP 12 SOUTH, RANGE 20 EAST; THENCE CONTINUING SOUTHEASTERLY, ALONG THE SOUTH BANK OF THE KANSAS RIVER, TO THE NORTHWEST CORNER OF A TRACT RECORDED IN BOOK 1056, PAGE 5024, SAID POINT LYING 739.2 FEET EAST OF THE WEST LINE OF THE NORTHWEST QUARTER SECTION 36, TOWNSHIP 12 SOUTH, RANGE 20 EAST; THENCE SOUTH, ALONG THE WEST LINE OF SAID TRACT, AND PARALLEL TO THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 36, TOWNSHIP 12 SOUTH, RANGE 20 EAST TO A POINT 151.78 FEET WEST OF THE NORTHWEST CORNER OF THE TRACT RECORDED IN BOOK 1000, PAGE 3430; THENCE EAST 151.78 FEET TO THE NORTHWEST CORNER OF SAID TRACT; THENCE SOUTH 660 FEET, ALONG THE WEST LINE OF SAID TRACT, TO THE SOUTH LINE OF THE NORTHWEST QUARTER OF SECTION 36, TOWNSHIP 12 SOUTH, RANGE 20 EAST; THENCE WEST ALONG SAID SOUTH LINE, 890.98 FEET TO THE SOUTHWEST CORNER OF THE NORTHWEST QUARTER OF SECTION 36, TOWNSHIP 12 SOUTH, RANGE 20 EAST, ALSO KNOWN AS THE NORTHEAST CORNER OF THE SOUTHEAST QUARTER OF SECTION 35, TOWNSHIP 12 SOUTH, RANGE 20 EAST; THENCE SOUTH, ALONG THE EAST LINE OF SAID SOUTHEAST QUARTER TO THE SOUTHEAST CORNER OF SAID SECTION 35, TOWNSHIP 12 SOUTH, RANGE 20 EAST; THENCE WEST, ALONG THE SOUTH LINE OF SAID QUARTER, TO THE POINT OF BEGINNING. CONTAINS 465 ACRES, MORE OR LESS.

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SCALE: 1" = 400' 400



Evaluation of Penny's Concrete and Sand LLC, Proposed Sand Pit Operation on Ground Water For the Lawrence Facility

For

Penny's Concrete and Sand LLC 23400 West 82nd Street Shawnee, Kansas

By

Carl E. Nuzman, P.E., P.Hg. Consulting Engineer/Hydrogeologist 3314 NW Huxman Road Silver Lake, KS 66539

Phone 785 224 9929

September 12, 2012

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- 7. EUDORA WELLS AREA OF CAPTURE
- 8. WELL-HEAD PROTECTION STUDY
- 9. SAND PIT OPERATION
- **10. FINDINGS OF THE INVESTIGATION**
- **11. CONCLUSION**

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- A. Penny Sand Lawrence Facility Area Plan
- B. West to East Geologic Cross-Section along N 1500 Road
- C. Distance-Drawdown Semi-Log Plot of Eudora's Wells No's 6, 7, & 8
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- I. Selected WWC-5 Water Well Logs in Study Area
- II. KDA, Division of Water Resources, Safe Yield Analysis Data
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Evaluation of Penny's Concrete and Sand LLC,

Proposed Sand Pit Operation on Ground Water for the Lawrence Facility

1. INTRODUCTION

A study and evaluation was made of the aquifer characteristics of the Kansas River Valley alluvial sediments in the vicinity between Lawrence, KS and Eudora to determine if any detrimental effects will occur to the existing wells in the vicinity of the proposed sand mining operation. Penny Concrete and Sand proposes to establish a pit to mine sand located in the East ¹/₂, and the NE¹/₄ of the NW ¹/₄ of Section 35 excluding two outparcels, the West 60 acres of the West ¹/₂ of the NW ¹/₄ of Section 36, and a portion of the SE¹/₄ of the SE¹/₄ of Section 26, all in Township 11 South, Range 20 East in Douglas County, Kansas. Shown on Exhibit A is the conditional use permit (CUP) area where the proposed sand pit is located and wells registered with the Division of Water Resources Kansas Department of Agriculture.

2. GEOLOGIC SETTING

A study was made by Alvin E. Dufford of the Quaternary Geology and Ground-Water Resources of the Kansas River Valley between Bonner Springs and Lawrence. The results of his work were published by the University of Kansas for the Kansas Geological Survey in Bulletin 130, Part 1, in 1958. The Wakarusa River hugs the south edge of the valley while the Kansas River stays close to the north edge of the valley, narrowing as the valley approaches Eudora from the west.

The Kansas River valley has a general eastward slope of about 3 feet per mile with low dissected hills bounding the flood plain on both sides. The Kansas River valley alluvium merges with the Wakarusa River valley alluvium near the center of Section 10, Twp 13 South, Range 20 East in Douglas County, Ks. The valley alluvium that comprises the aquifer consists principally of sand but contains lenses of both coarser and finer material. Generally, the saturated thickness of the aquifer is about 40 to 50 feet thick in the deepest part of the valley but thins to about 20 feet in the vicinity in the saturated thickness, in the proposed sand mining operation. Bed roc elevation in the area was defined by Stuart W. Fader in Ground Water in the Kansas River Valley, Junction City to Kansas City, Kansas in Bulletin No. 206, Part 2.

Well logs of selected wells in the area are given in Appendix I from the WWC-5 forms filed with the Kansas Geological Survey water well log file in Lawrence, KS. Exhibit B, is a geologic west to east cross-section along North 1500 Road showing the geology profile in that area. Static

water levels given on the well log reports do not reflect average conditions of the aquifer. Static water levels can vary several feet with changes in precipitation in the area. The static water levels will be higher during periods of normal or above normal precipitation and will decline during periods of drought. Static water levels given in the WWC-5 reports may not have been allowed to completely stabilize after pumping.

3. HYDROLOCIC SITUATION

The Eudora area has a humid continental climate. Normally, more than 70% of the annual precipitation falls during the growing season from April through September. Precipitation during this period is usually from thunderstorms (high intensity rainfall of brief duration) in the evening and early morning hours. The mean hourly wind speed is about 10 miles per hour usually from the south or southwest, and the sun usually shines more than 60% of the daylight hours.

The Kansas River which flows in an easterly direction is the principal stream in the area. The Army Corps of Engineers normally maintains a minimum desirable stream flow of 1,000 cubic feet per second at the DeSoto gaging station on the Kansas /river. The Wakarusa River is hydrologically an important tributary stream because it is a major source of recharge to the alluvial aquifer, especially in the vicinity of major well fields.

4. SAFE YIELD ANALYSIS

The safe yield available for appropriation from an unconfined aquifer at a specific location is determined by the amount of average annual precipitation that becomes recharge to the aquifer occurring within the area of consideration by the Chief Engineer of the Division of Water Resources, Kansas Department of Agriculture. The area of consideration means the portion of the aquifer area that lies within a 2-mile radius from the proposed point of interest, which is the geo-center of the proposed sand pit.

Although a safe yield analysis is not required for a sand pit operation in the Kansas River Basin by the Division of Water Resources, Kansas Department of Agriculture, such an appraisal was made to identify all registered ground water appropriators within a two (2) mile radius of the proposed sand pit operation. There were 15 identified ground water users some of which have multiple water rights on file. All wells registered are given in Appendix II with the well information followed by the owner and their address.

Based on established recharge rate of 9.2 inches per year by the Division of Water Resources, the safe yield for the 2-mile circle comprising and effective area of 6,350 acres is 4,868.33 acre-feet.

The prior appropriations certified in the circle are 4,305.78 acre-feet, with the added permitted appropriated water totaling 5,429.45 acre feet. Only wells 7 and 9 of the City of Eudora are at the edge of 2-mile circle from the geo-centroid of the proposed Penny sand pit.

The City of Eudora's total appropriation of 699 ac-ft or 227.77 MGY for municipal appropriation including future water use for population growth was used in the model given in Exhibits E and F. The maximum authorized diversion rate or pumping in one day is 1.4 million gallons per day. Exhibits E and F show the proposed Penny sand pit will not affect the City of Eudora wells in any way. The over appropriation of water in the area is up-gradient from the City wells and serves to intercept any ground water contamination that may exist in the capture zone of the City of Eudora wells identified in Exhibit F.

5. AQUIFER PROPERTIES

You do not get water from a well. A well is a stabilized hole in the ground to gain access to water bearing material called an *aquifer*. The yield of an aquifer is controlled by the permeability of the geologic formation and the saturated thickness of that permeable formation. The yield of a well can never be greater than that of the aquifer and usually less depending upon the efficiency of well construction and development. A well can decrease in yield due to biological fouling and lack of proper maintenance but unless the static water level has a substantial decline reducing the saturated thickness, the yield available from the aquifer remains constant.

Data from the WWC-5 report for City Well No 8, shown in Appendix I was used to estimate the properties of the aquifer. The reported drawdown was 4 feet after 11 hours of pumping at 521 gallons per minute (gpm). These values give a well specific capacity of 130 gpm/foot of drawdown when constructed. This value is used to estimate the transmissivity of the aquifer which is estimated to be 220,000 gpd/ft. Utilizing the 25 feet of well screen installed which is less than the formation thickness; the calculated formation permeability is 8.800 gpd/ft^2 , a very good formation value. Typical average value of formation permeability for the Kansas River valley alluvium is about 5,000 gpd/ft², with a maximum value observed of 10,000 gpd/ft². Additional data was found for City wells No. 6 and No. 7. The original specific capacity for well No. 6 was 101.7 gpm/foot of drawdown. The estimated formation transmissivity of the aquifer at well No. 6 location is 172,900 gpd/ft. The original well specific capacity for well No. 7 was 126.8 gpm/ft which gives an estimated formation transmissivity of 215,600 gpd/ft. An average transmissivity value of 210,000 gpd/ft was used to model the aquifer in Exhibits 6 and 7. This value under estimates the transmissivity in the deeper portions of the aquifer and over estimates the transmissivity near the boundaries of the aquifer. The 210,000 gpd/ft is in the same range that was determined by S. W. Fader in Bulletin No. 206, part 2, figure 7.

When a well is pumped, the pump energy creates a partial vacuum that causes a cone of depression to develop around the bore hole. The bore hole for the construction of Well No. 8 was reported to be 42 inches which gives a well radius of 1.75 feet. Using the formation transmissivity value of 220,000 gpd/ft, the drawdown per log cycle was calculated to be 1.0 foot for a pumping rate of 325 gpm, which is the maximum authorized pumping rate established for well No. 6. This information was then plotted on a semi-log plot to obtain the radius of influence for well 6, well 7 and well 8, Reference Exhibit C. The zero (0) drawdown for wells 6 & 7 was 2,400 feet and 2,100 feet for well 8. Drawdown values of less than 1 foot are considered insignificant since annual variations of static water level may vary more than 2 feet in a year due to weather conditions. The 1-foot drawdown occurs at a radius from about 130 to 260 feet for each of the wells shown in Exhibit C. The basic assumptions in the calculations for Exhibit C assume the world is flat and the aquifer properties are ideal. The approximate 1,000 feet distance between City wells minimizes the mutual interference effects from simultaneous pumping of these wells.

6. AQUIFER WATER YIELD AND AREA OF WATER CAPTURE

Simple model system was developed using the analytical-element method often used in modeling well-head protection. The State Geological Survey of Kansas had experienced geologists investigate the Kansas River valley geology and ground water resources from Bonner Springs to the vicinity of Manhattan. The reach of special interest is contained in Bulletin 130, Part 1, Quaternary Geology and Ground-Water Resources of Kansas River Valley between Bonner Springs and Lawrence, Kansas. At that time, the Kansas Geological Survey had their own small drilling rig in which to drill test holes. Many of the data points used in the model were from this work dated back to the 1940's and 1950's.

Figure 3 in Bulletin 130, Part 1 is the basis for the development of Exhibit D, a generalized static water table of the area of interest. In the 1950's there was little or no large pumpage in this area of interest which gives a good representation of pre-development conditions for the aquifer. Since the measurements upon which Figure 3 was based occurred over a period of years, exact replication of the water level elevations was not possible. Using statistical analysis, a very reasonable simulation of the water table gradient was obtained.

The model was then used to simulate the probable maximum pumping rate of 1.4 million gallons per day to obtain the area of direct influence of the City of Eudora well field. You will note that the area of 1 foot drawdown for the City of Eudora's peak pumpage is not circular but somewhat egg shaped extending more up-gradient to the west than to the east. Average annual pumping rate is estimated at 60% of peak day rate. Thus the development of the drawdown simulated in Exhibit E is a representation of the maximum drawdown expected in the future.

A feature of the model called particle tracking was then used to plot the movement of water in the aquifer to each of the four wells shown in Exhibit F. Based on the maximum allowable pumpage of 227.77 MGY authorized by the City's water rights on file with the Division of Water Resources, the travel time of water in the aquifer was calculated. The time period selected was 25 years. Each little collar around the straw like flow path lines represents one (1) year of flow. Due to the hydraulic gradient of the valley aquifer system and recharge to the aquifer from rainfall, **the aquifer flow to the City wells is from the west-southwest.** The Penny sand pit will be a half mile north of the capture zone of the City wells and will have no influence on the Eudora public water supply wells.

7. WELL-HEAD PROTECTION STUDY

The City's concern in regard to protecting the future quality of water from their well field must focus on the area in the immediate vicinity of the wells and to the west of the wells.

In so far as contaminants in the aquifer, the water movement is from west to east in a downgradient direction. The estimated travel time of water in the Kansas River alluvium aquifer, based on the general formation transmissivity and land surface gradient is about 0.7 feet/day or 8.4 inches per day, a very slow migration rate.

Several potential contamination sources, given in Appendix III, have been identified that could potentially threaten the water quality of the Eudora well field:

- a. Septic tanks at the several domestic residences in the vicinity are each a potential threat to the water quality of the City wells.
- b. To the east of Well No. 6 near the point of stagnation is or was a cattle feeding operation with livestock present as shown in Appendix III.
- c. Chemical fertilizer and herbicides applied to corn planted next to the wells as shown next to Well No. 6 in Appendix III, are a potential threat of contamination to the City wells. This threat of contamination is increased with irrigation, especially on sandy soils. Major portions of Hall and Merrick Counties in Nebraska have nitrates nearly double that of the KDHE and EPA regulations for Nitrates in public water supply due to irrigation and chemigation of corn on sandy loam soils similar to the alluvial soils shown in Bulletin 206, Part 2, Ground Water in the Kansas River Valley Junction City to Kansas City, Kansas by Stuart W. Fader. The Newman Terrace clay loam soils offer more protection of the aquifer from fertilizers.
- d. Abandoned wells or old domestic wells that were drilled long ago with thin wall casing that have corroded through the years and were not grout sealed, can allow

storm water runoff to flow directly into the aquifer resulting in direct contamination to the City wells. Such a well may exist west of Eudora Well No. 7 as shown in Appendix III, under the old windmill tower.

The C. McElwee domestic well is up gradient from the sand pit and down-gradient from the Kansas River. Although the property is about 5 acres in area, it is recommended that the set back of the pit mining be 300 feet from his property line. The radius of influence of the domestic well is less than 300 feet and will not be adversely affected by the sandpit.

8. SAND PIT OPERATION

The static water level elevation in the sand pit will be about the same as the water surface elevation in the Kansas River. Sand pit lakes that are within the effective radius of influence of a water well support the water production from a well during drought conditions due to the increase of lake water storage which is 5 times greater than the water storage yield capacity of the aquifer itself. This storage yield effect is applicable to any unconsolidated aquifer. Sand pits beneficially support the yield of wells that are down-gradient from a pit that is within the area of influence of a well.

Water pumped by the sand dredge is piped to the sand separator, and then water is diverted to a sediment pond, and returned to the sand pit. Storm water runoff from local precipitation is diverted around the pit. Berms and a grass swale will be provided on the west and south sides of the sand pit for the diversion of local storm water runoff.

9. CONCLUSION

The City of Olathe was concerned about their well field more than 20 years ago when Penny Concrete and Sand proposed to open a pit next to their well field. This consultant was contacted by the City of Olathe and reviewed the situation. It was recommended to the City of Olathe at that time to maintain at least 500 feet of aquifer intact between the sand pit and any well. The sand pit shown in Appendix III, directly up-gradient from the Olathe wells has <u>never</u> caused any contamination to their wells. Since that time, more studies have been made both in Kansas and other states and no significant contamination of an aquifer has been attributed to a sand pit in unconsolidated alluvial aquifers.

Present regulations require 200 feet separation between a surface water source and a well to allow normal biological activity of surface water to be filtered before entering the well. It is recommended that a 300 foot set-back be maintained between the property boundary of any

residence out parcel and the active dredging of sand from the pit. The recommended set back from all road right-of way is 100 feet.

It was found in this study that the proposed Penny sand pit lake that will eventually be developed in this study area will have *absolutely no* effect on the McElwee wells, Public Wholesale Water Supply District No. 25 or City of Eudora's wells or water supply. The threat of contamination does exist to Public Water Supply wells, but not from the proposed Penny sand mining operation, but from adjacent property to their wells.

EXHIBITS

- A. Penny Sand Lawrence Facility Area Plan
- B. West to East Geologic Cross-Section along N 1500 Road
- C. Distance-Drawdown Semi-Log Plot of Eudora's Wells No's 6, 7, & 8
- D. Generalized Static Water Table in Area (From KGS Bull. 130, Part 1)
- E. Eudora Wells Drawdown at Peak Day Pumpage of 1.4 MGD
- F. Groundwater Flow Paths to Eudora Wells at 227.77 MGY Pumpage

Evaluation of Penny's Concrete and Sand LLC,

Proposed Sand Pit Operation on Ground Water

For the Lawrence Facility

For

Penny's Concrete and Sand LLC

23400 West 82nd Street

Shawnee, Kansas

By

Carl E. Nuzman, P.E., P.Hg.

Consulting Engineer/Hydrogeologist

3314 NW Huxman Road

Silver Lake, KS 66539

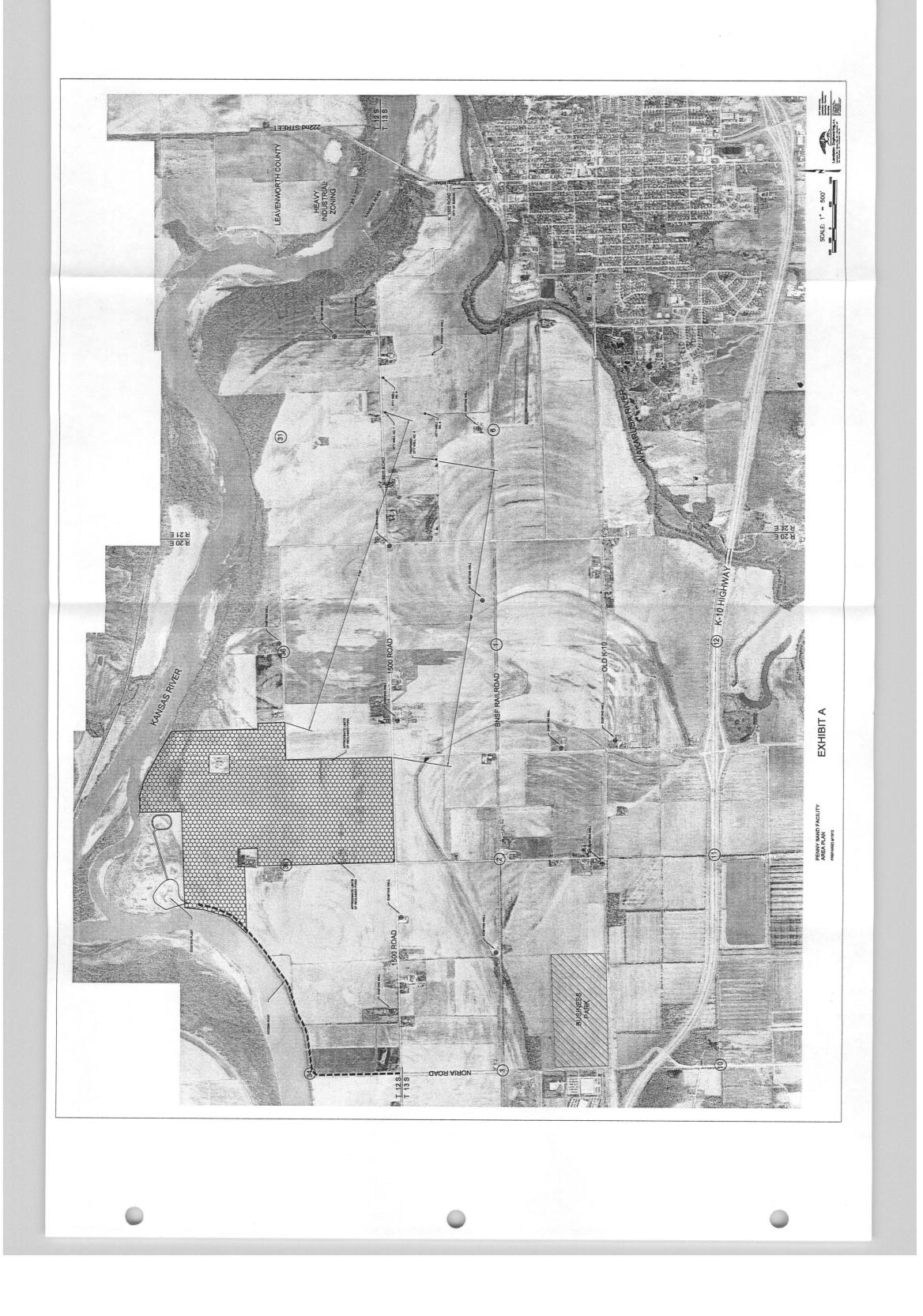
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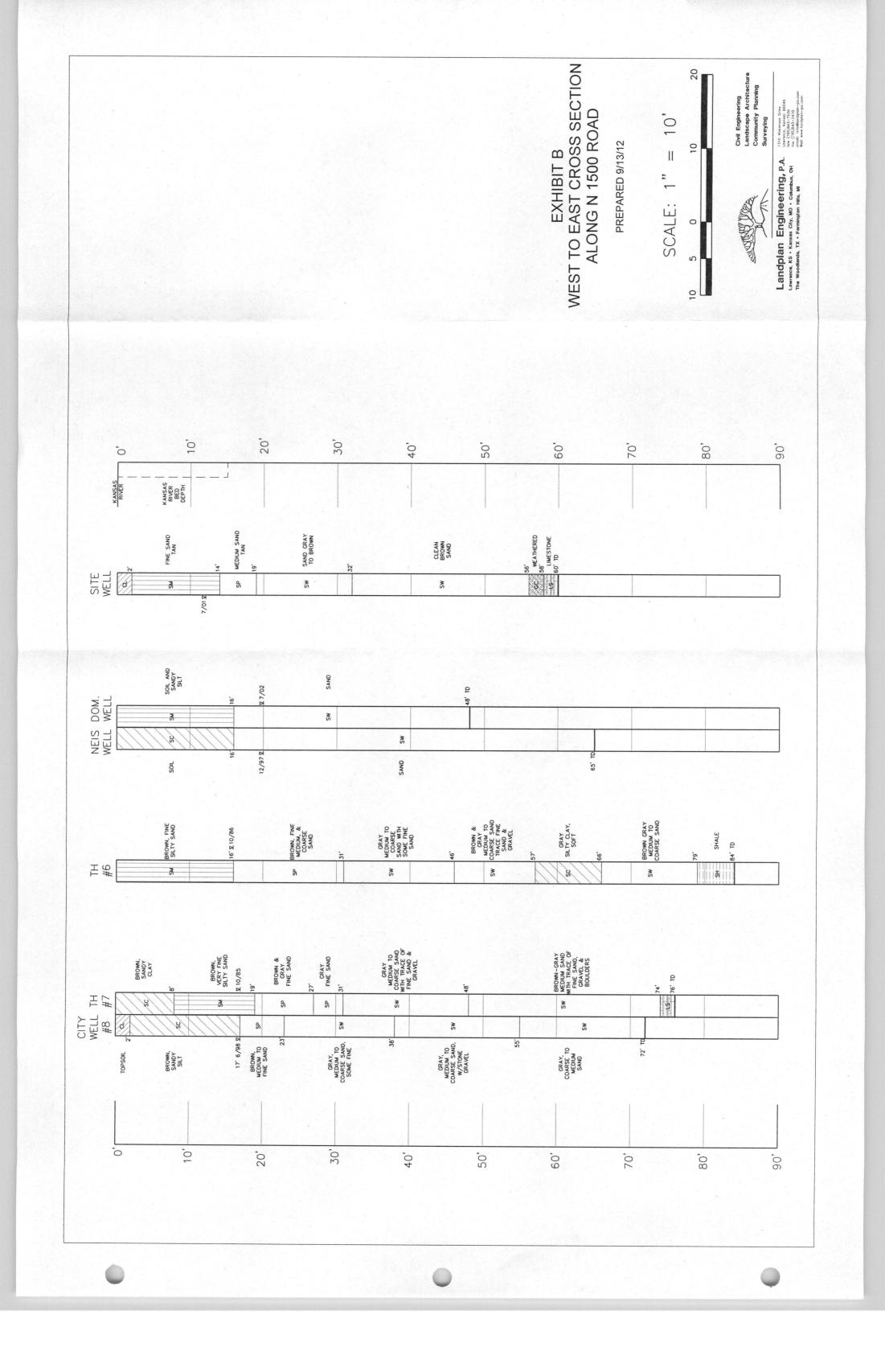
September 12, 2012

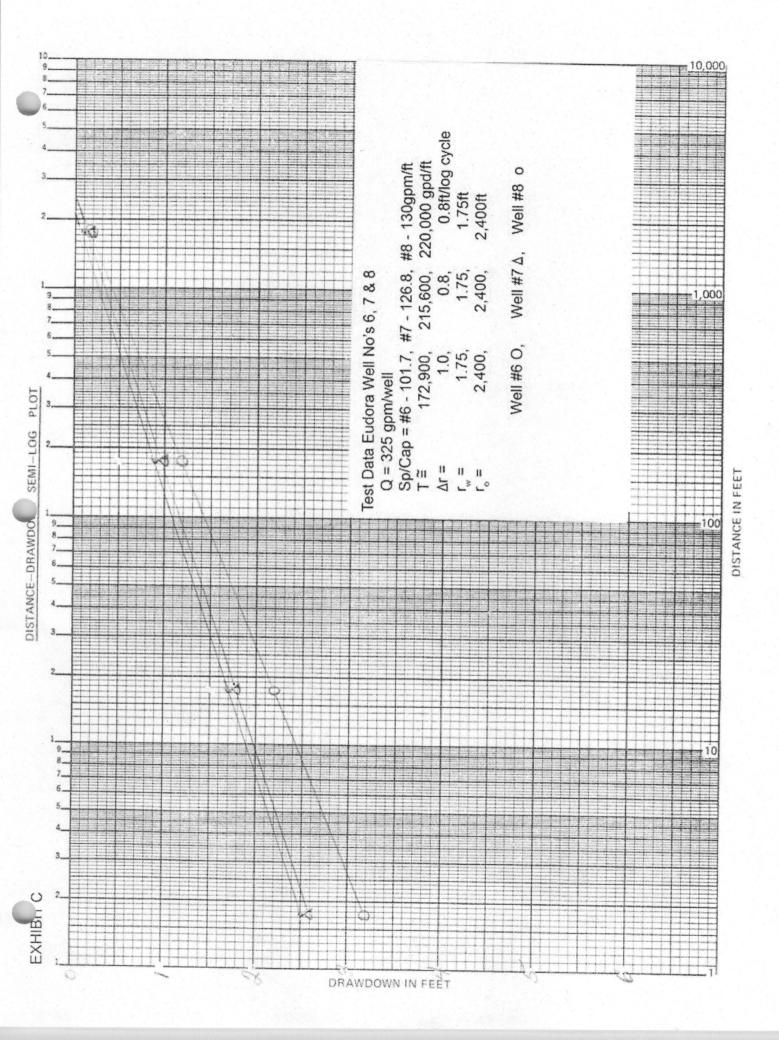


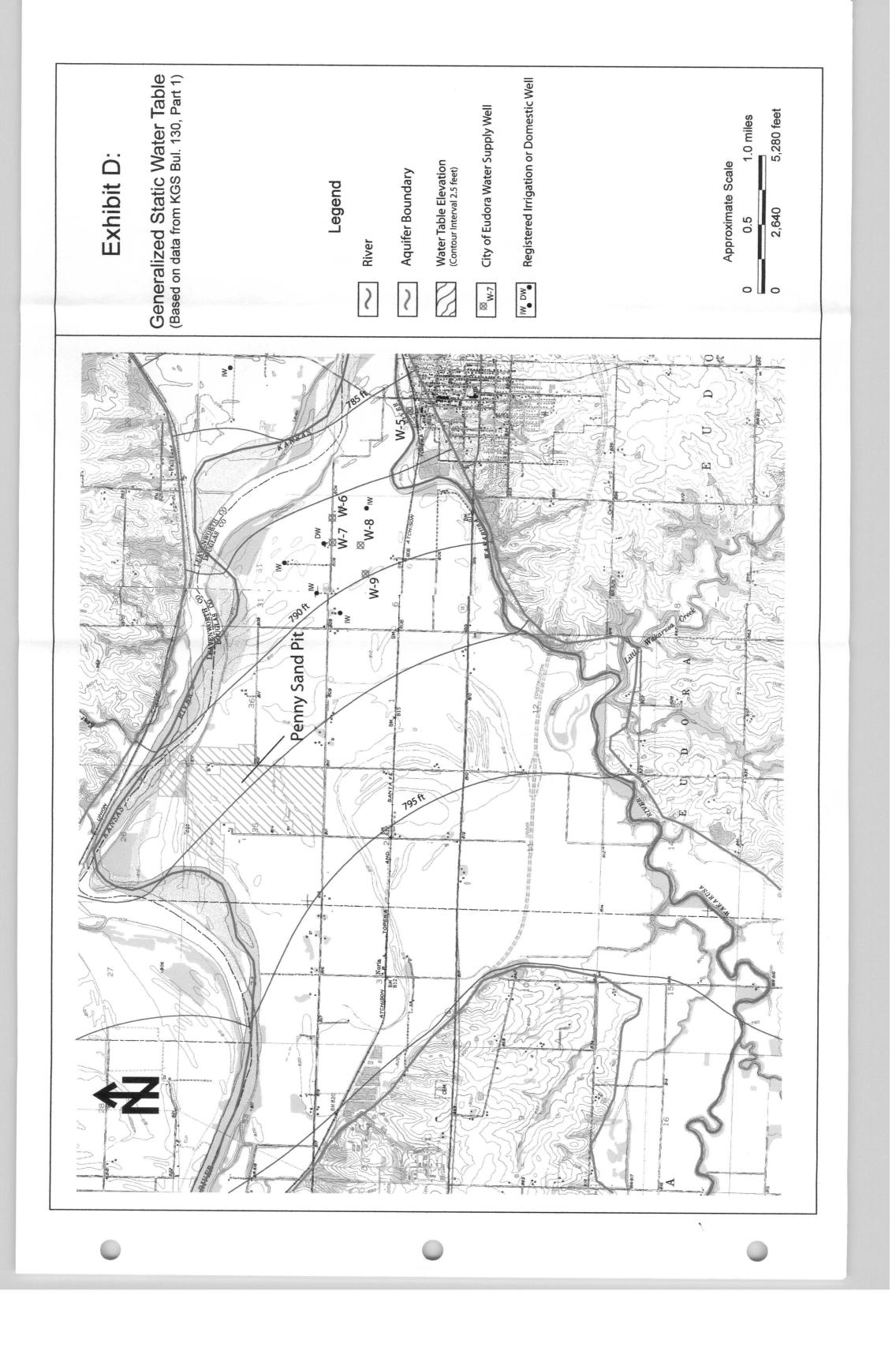


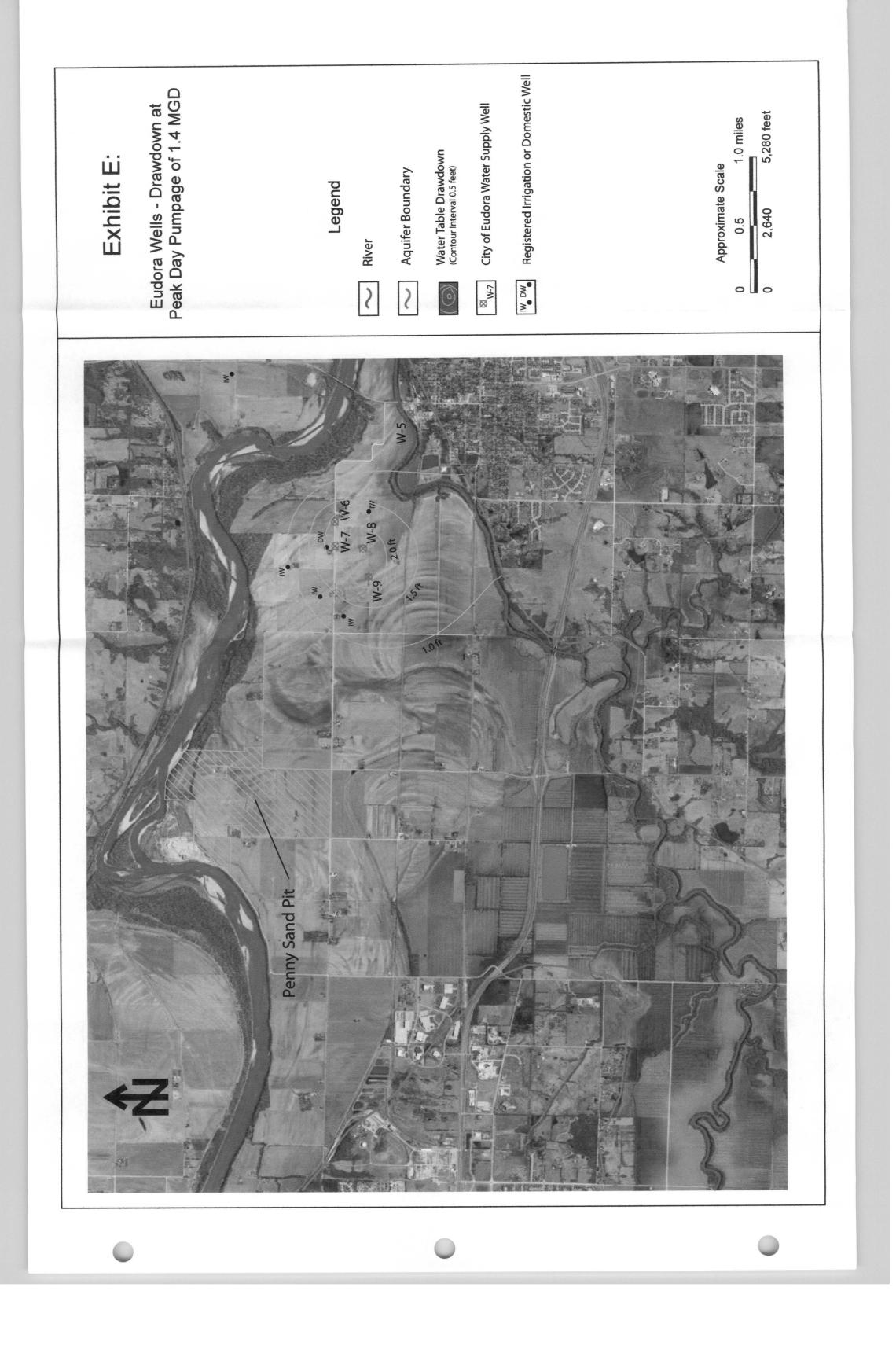


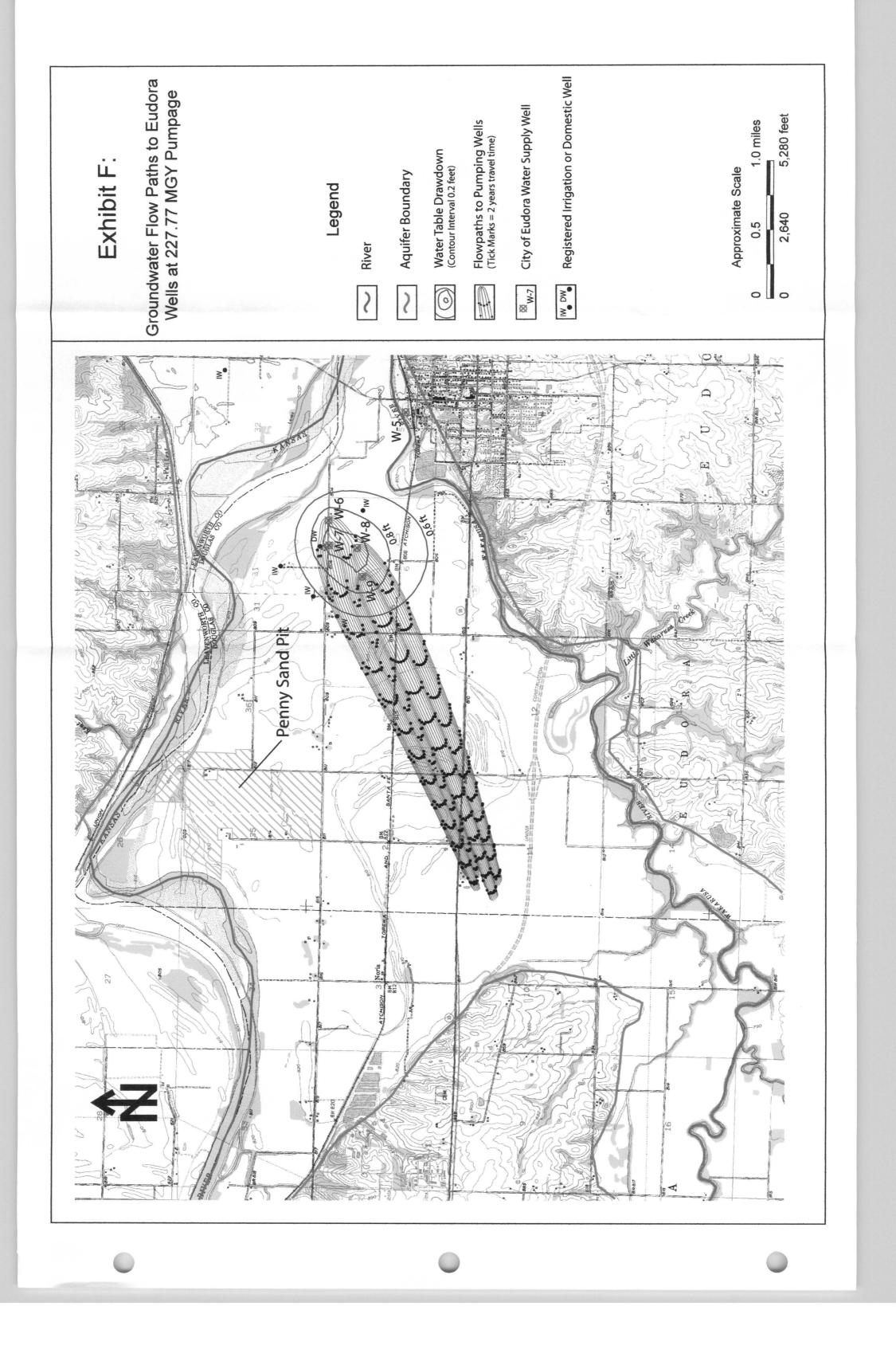












APPENDICES

I. Selected WWC-5 Water Well Logs in Study Area	I.	Selected	WWC-5	Water	Well L	logs in	Study	Area
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- II. KDA, Division of Water Resources, Safe Yield Analysis Data
- **III.** Potential Pollution Sources in the Area
- IV. Carl E. Nuzman, Resume' and Personal Information

APPENDIX I.

Selected Water Well Logs from the Kansas Geological Survey Well Log Library for Sections 34, 35, and 36 in Twp 12 South Rng 20 East, Sections 1, 2, 3, 11, and 12 in Twp 13 South Rng 20 East, Section 31 in Twp 12 South, Rng 21 East, and Sections 5 and 6 in Twp 13 South, Rng 21 East, all in Douglas County Kansas.

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	W							nping gpm
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	5 -1 mile-		day/yr sample was sub fected? 🛛 Yes 🗌					
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1		ell Contractor's License No ss name of Clarke	Well & Equipment	Vater Well F , Inc.		as completed	on (mo/day/year) 10/06/09
INSTRUC	TIONS: U	se typewriter or hall point ner	PIEASE PRESS FIRMI	Y and PRINT	clearly P	lease fill in blank	s and check the corre	ect answers. Send three copies
(white, blu	ue, pink) t	o Kansas Department of Health 5522. Send one copy to WATE	and Environment, Bureau	of Water, Ger	logy Sect	ion, 1000 SW I	ackson St Suite 420	Toneka Kansas 66612-1367
http://www KSA 82a-	v.kdheks.g	ov/waterwell/index.html.						
NOA 028-	1212				Cł	neck: 🗌 Wh	nite Copy, 📙 Bl	ue Copy, 🗌 Pink Copy

USE TYPEWRITER OR BALL POINT PEN-PRESS FIRMLY. PRINT CLEARLY. WATER WELL RECORD Kansas Department of Health and 212 Environment-Division of Environment KSA 82a-1201-1215 (Water well Contractors) 38.97063 95 20599 Topeka, Kansas 66620 NE NE Fraction 3. Owner of well: E.C. R.R. or street: 12 City, st-4 County Section number Township number Range number 5/4 1. Location of well: Doug las. SR EDW 2. Distance and direction from nearest town or city: 2m Wes ALTENBERLD Street address of well location if in city: COORA HTS. 6025 6. Bore hole dia. 10 in. Completion dat NEW15-7 4. Locate with "X" in section below: Fidom Well depth 47 ft. N 10 hinty 7. X Cable tool ___ Rotary ___ Driven __ Dug Hollow rod ____ Jetted ____ Bored ____ Reverse rotary NW NE -8. Use: ___ Domestic ___ Public supply ___ Industry AN A Mile W F _____ Irrigation ____ Air conditioning ____ Stock t ____Lawn ____Oil field water ____Other SW SF 0 Q 9. Casing: Material Steel Height: Above or below L well Threaded _____ Welded _____ iSurface _____2 RMP_____ PVC ____ Weight 26 _lbs./ft. S Dia. 2 in. to 32 ft. depth Wall Thickness: inches or - 1 Mile -Dia. _____ in. to _____ ft. depth gage No. ___250 5. Type and color of material From To 10. Screen: Manufacturer's name _ Johnson 0 Type 5 Ta less Dia. Length _ Stor gauze 2 32 Set between ____ ft. and _ £+ ft. and _ 25 27 Gravel pack? MD Size range of material. 11. Static water level: mo./day/yr **3.3-5** ft. below land surface Date <u>MOP 15-77</u> mo./day/yr. 27 31 31 12. Pumping level below land surfaces: 34 _____ ft. after ______ hrs. pumping g.p.m. 34 38 _____ ft. after ______ hrs. pumping .g.p.m. Estimated maximum yield _____ 30 0 .g.p.m. 38 13. Water sample submitted: mo./day/yr. Date Yes No No 40 14. Well head completion: 12+ Inches above grade Pitless adapter 15. Well grouted? Ves With: X Neat cement _____ Bentonite Depth: From _____ ft. to _____ ft. Bentonite _ Concrete 16. Negrest source of possible contamination: Lives Well disinfected upon completion? _____ Yes No No 17. Pump: _ Not installed Jacuz-21 Manufacturer's name Model number 556X1 HP_ ____ Volts Length of drop pipe 47 ft. capacity 300 g.p.m. Type: X Submersible _ Turbine ____ Jet Reciprocating (Use a second sheet if needed) Centrifugal Other 18. Elevation: 19. Remarks: 20. Water well contractor's certification: This well was drilled under my jurisdiction and this report 81 is true to the best of my knowledge and belief. Topography: TURBMARABMOS DAILLING. CO. 119 Hill Business name Address License No AB ONDAL Slope Hance. Upland B Signed Valley epresentative

Forward the white, blue and pink copies to the Department of Health and Environment RR < 764 P = 787

Form WWC-5

USE TYPEWRITER OR BALL POINT PEN-PRESS FIRMLY, PRINT CLEARLY. WATER WELL RECORD Kansas Department of Health and Environment-Division of Environment KSA 82a-1201-1215 (Water well Contractors) 95.20596 38.96880 210 Topeka, Kansas 66620 County Fraction Range number Section number Township number 1. Location of well: SE 1/4 NE 1/4 NE 1/4 T 12 S R 20 3.5 CE/W 3. Owner of well: E. C. Alt = rburn R.R 2. Distance and direction from nearest town or city: Z in 1, E, R.R. or street: Electora 55. 66025 Street address of well location if in city: Lawrence, Ks City, state, zip code: 6. Bore hole dia! - Y in. Completion date Kan 4. Locate with "X" in section below: Sketch map: Well depth-57 ft. 8-25-N well y Bern 7. ____ Cable tool 👗 Rotary ____ Driven ___ Dug I ____ Hollow rod ___ Jetted ____ Bored ___ Reverse rotary NE-X - NW DeadEh 1 8. Use: XDomestic __ Public supply __ Industry Mile W F ____ Irrigation ____ Air conditioning ____ Stock Oil field water Other Lawn SW -- SE -9. Casing: Material PUC Height Above or below Surface 24 Threaded _____ Welded ___ RMP____ PVCC/ue Weight 2,74 Ibs./ft. S Dia.5 in. to 51 ft. depth Wall Thickness: inches or 1------ 1 Mile -----Dia. _____ in. to _____ ft. depth gage No. 2.58 From To 5. Type and color of material 10. Screen: Manufacturer's name <u>Ptempeo</u> Type <u>Puc</u> D Top Soil Silt 8 21 5 Dia._ Туре ____ 10 Slot/gauze 1280 Length _ Brown Fine Soul 11 15 51 41 Set between _ ft. and _ ft ft. and _ Brown Come Sen 15 32 Gravel pack? Kes Size range of material 11. Static water level: mo./day/yr by Med Grave 33 38 12 ft. below land surface Date 8-25-17 12. Pumping level below land surfaces: History 38 Clay 41 _____ ft. after _____ hrs. pumping _ g.p.m _____ ft. after _____ hrs. pumping Estimated maximum yield ______ med, Gray. Grovel 41 51 m. g. p m.q.p. hineston. 13. Water sample submitted: 51 mo./day/yr Yes Ko Date 14. Well head completion: Top Cap Pitless adapter 24 Inches above grade 15. Well grouted? With: Neat cement ____ Bentonite _ Concrete Depth: From 6 ft. to 10 ft. Typehatens Well disinfected upon completion? _ X: Yes X Not installed 17. Pump: Manufacturer's name HP Model number Volts Length of drop pipe -_ ft. capacity _____g.p.m. Type: ____ Submersible ____ Turbine ____ Jet ____ Reciprocating Centrifugal Other (Use a second sheet if needed) 18. Elevation: 19. Remarks: 20. Water well contractor's certification: This well was drilled under my jurisdiction and this report Owney will Pour Slob is true to the best of my knowledge and belief. Topography: 1/4 STRAder DRIG 60 Hill Address ADITONU, License No. 1/4 Slope Upland Signed Han li Asterior Valley

Forward the white, blue and pink copies to the Department of Health and Environment

Form WWC-5

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		W	ATER WELL REC	CORD F	orm WWC-5	KSA 82a	-1212 ID N	No					
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Water Well	Contractor's	Licence No	182		This Water	Well Record	was complete	ed on (mo/d	lay/xr)	4-16	-04		
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and Enviro	onment, Bureau o	of Water, Geology Se	ection 1000 SW Jacks	on St Suite 42	O Toneka Kansas	66612-1367 T	elenhone 785,206	5522 Send on	to WATER W		and rate	in one for you	

and Environment, Bureau of Water, Geology Section, 1000 SW Jackson St., Suite 420, Topeka, Kansas 66612-1367. Telephone 785-296-5522. Send one to WATER WELL OWNER and retain one for your records. Fee of \$5.00 for each constructed well.

			WATER	WELL RECORD	Form WWC-5	KSA 82	a-1212		· · · · · · · · · · · · · · · · · · ·
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		$l^{\frac{1}{2}}$ west,	$l\frac{1}{2}$ north	of Eudora					
2 WATER	WELL OW	NER: James	Waller						
	ddress, Box	1001 37	. 1550 Rd				Board	of Agriculture, I	Division of Water Resou
City, State,			, KS 660	25			Applic	ation Number:	
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1 -	- sw	SE	1 Domestic	_ 3 Feedlot					
	1	T	2 Irrigation	4 Industrial					
+ L	1	Wa	is a chemical/ba	acteriological sample	e submitted to D				mo/day/yr sample was
-	S		tted					ected? Yes	
5 TYPE O	F BLANK C	ASING USED:		5 Wrought iron					dXClamped
1 Stee	el	3 RMP (SR)		6 Asbestos-Cemen	t 9 Other	(specify belo	(wc	Weld	ed
2 PVC		4 ABS		7 Fiberglass					aded
									in. to
Casing heig	ht above la	nd surface	24"	n., weight 2	.82	Ibs	./ft. Wall thickn	ess or gauge N	o
TYPE OF S	CREEN OF	R PERFORATION M	IATERIAL:			C		Asbestos-ceme	
1 Stee	el	3 Stainless ste	el	5 Fiberglass		1P (SR)	11	Other (specify)	
2 Bras	SS	4 Galvanized	steel	6 Concrete tile	9 AB	S	12	None used (op	en hole)
SCREEN O	R PERFOR	RATION OPENINGS	ARE:	5 Gau	zed wrapped		8 Saw cut		11 None (open hole)
1 Con	ntinuous slo	t 3 Mill s	lot	6 Wire	e wrapped		9 Drilled ho	les	
2 Lou	vered shutt	er 4 Key p	ounched	7 Tor	ch cut		10 Other (sp	ecify)	
SCREEN-P	ERFORATE	D INTERVALS:	From 30.	ft. to		ft., Fr	om	ft. t	0
			From	ft. to		ft., Fr	om	ft. t	0
G	RAVEL PAG	CK INTERVALS:	From 24.	ft. to		ft., Fr	om	ft. t	0
			From	ft. to		ft., Fr	om	ft. t	0
6 GROUT	MATERIAL	: 1 Neat cem	ent 2	2 Cement grout	3 Bento	onite 4	4 Other		
Grout Interv	als: Fror	n	to24	ft., From	ft.	to	ft., Fro	m	ft. to
		urce of possible cor							bandoned water well
1 Sep	tic tank	4 Lateral li	nes	7 Pit privy		11 Fue	l storage	15 C	il well/Gas well
	ver lines	5 Cess po		8 Sewage la			tilizer storage		ther (specify below)
		er lines 6 Seepage		9 Feedyard	5		ecticide storage		
Direction fro		north						200'	
FROM	TO		LITHOLOGIC L	.OG	FROM	TO		PLUGGING I	NTERVALS
0	4	Top Soil	Second Second						
4	15	Clay-Brown-	-Silty						
15	33	Fine Sand-			1				
33	39	FS-CS-Med							
39	40	FS-CS-Med							
		neu_	staver bri	ue					
						×			
						1. 1. 1. 1. 1.			
						1			
	1.1.1.1.1.1.1								
						1.1.1.1.1.1.1			
	-								
	107070		000000000000000000000000000000000000000			L	L	(0)	
									der my jurisdiction and
									owledge and belief. Kar
				This Water					
		me of STRADER				and the state of the state of the state			ekron
INSTRUC	TIONS: Use typ	pewriter or ball point pen.	PLEASE PRESS FIL	RMLY and PRINT clearly.	Please fill in blanks,	underline or cir	cle the correct answ	vers. Send top three	copies to Kansas Department

95,12494	38,	WATE	ER WELL RECORD	Form WWC-	5 KSA 82a-1	212	
LOCATION OF WATER WELL	and the second design of the s	ction	NE 1/4 NE	Se	ection Number		Range Number
Distance and direction from neare	est town or	city2/W	.SNOF	1	tress of well if lo	cated within city?	
		E	udoina				
ATER WELL OWNER: HC		whaley	•			Board of Agricultur	e, Division of Water Resource
Dity, State, ZIP Code : Eu		KANSA	5 66025			Application Numbe	
DEPTH OF COMPLETED WE	LL. 5	0ft. B	ore Hole Diameter	12 ir	n. to	ft., and	in. to fr
Nell Water to be used as:		blic water s	supply	8 Air cond	ditioning		
1 Domestic 3 Feedlot	6 Oil	field water	supply	9 Dewate	ring	12 Other (Spe	ecify below)
2 Irrigation 4 Industrial		wn and gar	den only	10 Observa	ation well		
Nell's static water level 3							. day
	: Well w	vater was				ours pumping ours pumping	gpm gpm
1 TYPE OF BLANK CASING US							ued Clamped
			6 Asbestos-Cement				elded
2 PVC 4 AB Blank casing dia 5	S	0 0	7 Fiberglass			Th	nreaded
Blank casing dia 2 Casing height above land surface	· · in. to ·	0-40	ft., Dia	in. 2.0	to	ft., Dia	in. to f
TYPE OF SCREEN OR PERFOR		/				. Wall thickness or gaug 10 Asbestos-ce	
	ainless stee		5 Fiberglass				ify)
	Ivanized ste		6 Concrețe tile			12 None used	**
Screen or Perforation Openings A			5 Gauze	d wrapped		8 Saw cut	
	3 Mill slot					9 Drilled holes	
2 Louvered shutter	4 Key put	nched	7 Torch	cut	1	0 Other (specify)	
Screen-Perforation Dia	in. to		ft., Dia	in	. to	ft., Dia	in tof
							of
							of
							of
	rom						<u>, f</u>
5 ROUT MATERIAL: 1 1 Grouted Intervals: From	Neat cemer						
What is the nearest source of pos			II., FIOIII				Abandoned water well
	Cess pool	inination.	7 Sewage lago	on	11 Fertilize	-	Oil well/Gas well
dimension of the second	Seepage p	oit	8 Feed yard		12 Insectic		Other (specify below)
	Pit privy		9 Livestock per	าร			
Direction from well NOR T	h	How	many feet 200		? Water W	ell Disinfected? Yes	No
Was a chemical/bacteriological sa							
was submitted							
If Yes: Pump Manufacturer's name							
Depth of Pump Intake							
Type of pump: 1 Su 6 CONTRACTOR'S OR LANDON			Turbine			ugal 5 Reciproca	
completed on De.c.e.m.b.e.	P	ENTIFICAT	month 19	as (1) const	ructed, (2) recon	IGT 4	under my jurisdiction and wa
and this record is true to the best	of my know	wledge and	belief Kansas Water W	/ell Contract	or's License No	18:	уеа Д
This Water Well Record was com	pleted on	Dece	mber	onth		av 1979	vear under the busines
name of STRAdER DRL	g co.,	, In	ç. 1	by (signature) Dale	. aspren	
7 LOCATE WELL'S LOCATION	FROM	то	LITHOLOG	IC LOG	FROM		LITHOLOGIC LOG
WITH AN "X" IN SECTION BOX:	0	6	Top Soil				
N	6	20	Clay				
	20	35	Fine Sand				
1 1 X	3\$	80	course sand,	414vel			
							the second s
S 1 1 Mile							
ELEVATION:		1					
Depth(s) Groundwater Encountere	ed 1	30ft.	2 ft. 3	ft. 4.	ft.	(Use a second	sheet if needed)
INSTRUCTIONS: Use typewriter o copies to Kansas Department of He	r ball point-	pen, please	press firmly and PRINT	clearly Ple	ase fill in blanks	underline or circle the co	prrect answers. Send top three
retain one for your records.							

1.12

-1.

			ATER WELL RE	CORD	Form WW		32a-1212				
1 LOCATI	ION OF W	ATER WELL:	Fraction			Se	ction Numb	per	Township N	lumber	Range Number
	Douglas		NW 1/4		1/4 NW		1		т 13	S	R 20E E/W
Distance a	and directio	n from nearest t	town or city stree	et address	of well if lo	ocated within o	ity?				
1 mile	e north	2 ¹ / ₂ miles	west of Eu	Idora	1919 N.	1500Rd.	Eudora	660	25		
WATER	WELL OW	NER: Virgi	nia Strong	r					1989 - 201		
		x # : 3712							Board of Ag	griculture,	Division of Water Resources
	, ZIP Code			66049					Application	-	
		CATION WITH	A DEPTH OF		TED WELL	52	ft FIF	VATION	۷.		
	IN SECTIO		Denth(s) Groun	dwater Fr		1		ft. 2		ft. 3	ft.
	N OLOTIO		WELL'S STATE	CWATER	LEVEL	27 ft. be	ow land surf	face mea	asured on mo	/day/yr	.6-21-2001
A x											pumping
	NW	NE									pumping
	1										. in. to
Wile W	1	E	WELL WATER								
≥ vv	1		1 Domestic								Other (Specify below)
			2 Irrigation								
	- SW -	SE									
V		i	Was a chemical	/bacteriolog	gical sample	submitted to D	epartment? Y	Yes	NoX.	.; If yes, I	mo/day/yrs sample was sub
	S		mitted					ater We			x No ledxClamped
		CASING USED:				8 Conc		alow	CASING JC		ded
1 Stee		3 RMP (S	R)		tos-Cemen		r (specify be				eaded
2 PVC	<u>)</u>	4 ABS		7 Fiberg	lass						
Blank cas	sing diamet	er5	in. to		.ft., Dia		n. to		ft., Dia		in. to
Casing h	eight above	land surface	2.4	in., weigh	t	2.82	1	bs./ft. W	all thickness	or gauge l	No258
TYPE OF	SCREEN	OR PERFORA	TION MATERIA			_7 P'				bestos-cer	
1 Stee	el	3 Stainles			glass		MP (SR)				/)
2 Bra	SS	4 Galvani	zed steel	6 Concr		9 A				ne used (c	
and and a second s			NINGS ARE:					8	Saw cut		11 None (open hole)
	ntinuous slo		fill slot			ire wrapped		9	Drilled holes	f. ()	ft.
	ivered shut		key punched	26		orch cut					
CREEN	I-PERFOR/	ATED INTERVA	LS: From		ft. to		ft., Fr	rom		ft.	toft.
	CDAVEL		From		π. το ft to		IL, FI	rom			toft.
	GHAVEL	PACKINIERVA	From		ft to		ft., Fr	rom		ft.	toft.
				Seale and spin and				and the second sec			and a second
6 GROUT	T MATERIA	AL: 1 Neat o	cement	2 Ceme	nt grout						
1					., From						
			ible contaminatio	n:				vestock			Abandoned water well
		4 Late			7 Pit pri		11 Fu		•		Oil well/Gas well
	ver lines	5 Cess	and the state of the state			ge lagoon		ertilizer		16	Other (specify below)
	-	er lines 6 Seep	page pit		9 Feed	yard			e storage		
Direction	from well?	West					How	many fe		in the second	
FROM	ТО		LITHOLOGIC L	OG		FROM	то		PL	UGGING	INTERVALS
0	10	brown sil	lt								
10	18	brown cla	ay								
18	28	brown sil					1.000				
28	30		ne sand cou	arse sa	and		-				
30	38	brown fir	analises and a second state of the second state of								
38	40		ne sand com	irse sa	and med	gravel					
40	41	blue clay						1.11.5			
41	52	grey fine		1.1.1.1.1.1.1						1.1.1.1.	
		grey rin	<u> </u>				10000		2		
							1.1.1				
	-										
	-	-		No.			1				
	+							-			
CONTE	PACTORS				e water we	11 was (1) cons	tructed (2)	reconst	ructed or (3)	plugged u	nder my jurisdiction and was
											mowledge and belief. Kansas
1										1	1
			ader Drill:					(signat	AV A	len	laeron
INSTRUC	TIONS: Use typ	pewriter or ball point pe	en. <u>PLEASE PRESS F</u>	IRMLY and PH	RINT clearly. Ple	ease fill in blanks, u	nderline or circle	the correct	t answers. Send to	op three copies	to Kansas Department of Health and
Environme	ent, Bureau of V	Vater, Topeka, Kansas	66620-0001. Telephor	e 785-296-55	24. Send one to	WATER WELL OW	NER and retain of	one for you	r records. Fee of \$	5.00 for each g	constructed well.

F			WA	TER WELL RECORD	Form WWC-	5 KSA 82	a-1212	
1 LOCATIO	ON OF WA	TER WELL:	Fraction		Se	ction Number	Township Number	Range Number
County: I		the ball of a state of the stat	NW	The second s	1/4	1	т 13 s	R 20 E/W
Distance ar	nd direction		vn or city stree west of E	et address of well if locate	d within city?			
2 WATER	WELL OW	and the second se	ld Boehle					
-	ddress, Bo		E. 1900	Rd			Board of Agriculture	Division of Water Resour
City, State,	ZIP Code	: Eudor	ca, KS 6	6025			Application Number:	
3 LOCATE	N SECTIO	N BOX:					ATION:	
T L	1.						rface measured on mo/day/y	
1	i	i i i i					after hours p	
-	- NW	NE					after hours p	
0	i			ameter			and	
Mile W	1	I	WELL WATE	R TO BE USED AS:	5 Public wate	er supply	8 Air conditioning 1	Injection well
ī	1	1	1 Domes	tic 3 Feedlot	6 Oil field wa	ter supply	9 Dewatering 12	Other (Specify below)
	SW	SE	2 Irrigatio				10 Monitoring well	
	i	1	Was a chemic	al/bacteriological sample s	submitted to D	epartment? Y	'es No X; If ye	s, mo/day/yr sample was s
		5	mitted	-		Wa	ater Well Disinfected? Yes	X No
5 TYPE O	F BLANK	CASING USED:		5 Wrought iron	8 Concr	ete tile	CASING JOINTS: Glu	ed X Clamped
1 Stee		3 RMP (SI	7)	6 Asbestos-Cement	9 Other	(specify belo	w) We	ded
2 PV(4 ABS					Thr	eaded
Blank casin	g diameter		.in. to 04	0 ft., Dia	in. to		ft., Dia	. in. to
							/ft. Wall thickness or gauge	No
	· · ·	R PERFORATIO			_7 PV		10 Asbestos-cen	
1 Stee		3 Stainless		5 Fiberglass	8 RN	MP (SR)	11 Other (specify	/)
2 Bras	35.00	4 Galvaniz		6 Concrete tile	9 AE	IS	12 None used (c	
		RATION OPENIN			ed wrapped		8 Saw cut	11 None (open hole)
	ntinuous slo		ill slot		wrapped		9 Drilled holes	
	vered shut		ey punched	7 Torch			10 Other (specify)	
SOMELIN	LHIONAT	ED INTERVALS:					mft.	
G		CK INTERVALS:					۳	
G	HAVEL PA	CK INTERVALS:					vm ft. vm ft.	
6 GROUT	MATERIAL	.: 1 Neat of	and the second	2 Cement grout			Other	to
-							ft., From	
		ource of possible					stock pens 14	
							storage 15	
	ver lines	5 Cess		8 Sewage lage				Other (specify below)
		er lines 6 Seep		9 Feedyard				
Direction fro		sout!		3 Teedyard		How ma		*******
FROM	TO	Bout	LITHOLOG	IC LOG	FROM	ТО	and a superior of the second s	INTERVALS
0	6	Top Soil						
6	30	Clay-Brow	wn-Silty					
30	35			Sand-Blue				
35	41	Fine Sand						
41	47			Sand-Brown				
47	48	Clay-Blue						
48	50	Fine Sano	l-Coarse	Sand-Med Gravel-	-Brown	1.		
in straight	1.1		-					
			1 10 M					
CONTRA	ACTOR'S C	OR LANDOWNER	S CERTIFIC	ATION: This water well wa	as (1) constru	cted, (2) reco	onstructed, or (3) plugged ur	der my jurisdiction and w
completed o	n (mo/day/	year)	2-15-93			and this reco	ord is true to the best of my k	nowledge and belief. Kans
Water Well	Contractor'	s License No	182	This Water W	ell Record wa	is completed	on (mo/day/yr) . 4 7	9,3
				NG CO., INC.		by (signa		bren
INSTRUCT	TIONS: Use ty	pewriter or ball point p	oen. PLEASE PRES	S FIRMLY and PRINT clearly. Plea	ase fill in blanks,	underline or circle	e the correct answers. Send top thre	e copies to Kansas Department
of Health	and Environm	ent, Bureau of Water,	Topeka, Kansas 6	6620-0001, Telephone: 913-296-5	545 Send one to	WATER WELL O	WNER and retain one for your record	te

			WATE	R WELL RECORD	Form W	NC-5 KSA 82	a-1212		
	State Constant State 2	TER WELL:	Fraction			Section Numbe		ip Number	Range Number
	DOUGLA		NE 1/4		NW 1/4	2	T	<u>3</u> s	R 20 (E/W
Distance a	and direction	from nearest town		uddress of well if loo Lawrence @					~
				lawrence e	1037 1.	1300 Rd.			
and the second se	R WELL OV		Vallace				Deard	of Asulauthung I	Division of Maker Deservoirs
a contract of the second	Address, Bo	TLOT 1	E. 13th					•	Division of Water Resources
	, ZIP Code		nce, KS					ation Number:	
3 LOCAT	IN SECTIO								
Γ.	IX								
I I	1	1							imping gpm
-	NW	NE Es							imping gpm
e	1								. to
Mile W		Construction of the second sec		TO BE USED AS:		water supply		ning 11	
-	1	1	1 Domestic	3 Feedlot	6 Oil fiel	d water supply	9 Dewatering	12	Other (Specify below)
-	SW	SE	2 Irrigation	4 Industrial					
	1	l w	as a chemical/	bacteriological samp					, mo/day/yr sample was sub-
I L		And the second s	tted						No
5 TYPE	OF BLANK	CASING USED:		5 Wrought iron	8 C				dX Clamped
1 St	eel	3 RMP (SR)		6 Asbestos-Ceme					led
2 P\	/C	4 ABS		7 Fiberglass				Threa	aded
Blank casi	ing diameter								in. to ft.
									0
		R PERFORATION N				7 PVC		Asbestos-ceme	
1 St	eel	3 Stainless st	eel	5 Fiberglass			• 11	Other (specify)	
2 Br		4 Galvanized	steel	6 Concrete tile		ADS	12	None used for	en hole)
SCREEN	OR PERFO	RATION OPENINGS	ARE	5 G	auzed wrapp	ed	8 Saw cut		11 None (open hole)
1 Cc	ontinuous slo	ot 3 Mill s	slot	5 G. 6 W	/ire wrapped		9 Drilled ho	-	
2 Lo	uvered shut	tter 4 Key	punched	7 To	orch cut		10 Other (sp	ecify)	
SCREEN-	PERFORAT	ED INTERVALS:	From 4	l 5	o52		om	ft. t	toft.
									toft.
	GRAVEL PA	CK INTERVALS:							toft.
				ft. t					to ft.
6 GROUT	MATERIA	L: 1 Neat cerr	nent	2 Cement grout					
Grout Inte	rvals: Fro	mft.	to	ft., From		ft. to	ft., From	n .	ft. to
What is th	e nearest s	ource of possible con	ntamination:			10 Live	stock pens	14 A	bandoned water well
1 Se	eptic tank	4 Lateral I	ines	7 Pit privy		11 Fue	l storage	15 C)il well/Gas well
2 Se	ewer lines	5 Cess po	ol	8 Sewage	lagoon	12 Fert	ilizer storage	16 C	Other (specify below)
3 W	atertight sev	ver lines 6 Seepage	e pit	9 Feedyard	d	13 Inse	cticide storage		
Direction 1	from well?	south				How m	any feet?	50'	
FROM	то		LITHOLOGIC	LOG	FRC	M TO		PLUGGING I	NTERVALS
0	4	Top Soil							
4	15	Clay-Brown-	-Silty						
15	27	Silt-Brown			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
27	31	Fine Sand-H	Brown						
31	32	Clay-Blue							
32	35	Fine Silt-H							
35	39	Clay-Brown							
39	41	Fine Sand-H	Brown						
41	47	Fine Sand-(
47	52			nd-Med-Pea	Brown				
				19		1.11			•• ••
					5			and the second second	
									·
CONTR	RACTOR'S	OR LANDOWNER'S	CERTIFICAT	ION: This water we	II was (1) co	nstructed, (2) rec	constructed, or	(3) plugged und	der my jurisdiction and was
completed	on (mo/day	/year)2/	2.4/.98			and this rec	ord is true to th	e best of my kn	owledge and belief. Kansas
		's License No							
		me of STRADER				by (sign		11 111 1	
INSTRU	CTIONS: Use t	pewriter or ball point pen.	PLEASE PRESS	FIRMLY and PRINT clearly	y. Please fill in bl	anks, underline or circ	le the correct answ	ers. Send top three	copies to Kansas Department
of Healt	th and Environn	nent, Bureau of Water, Top	eka, Kansas 6662	0-0001. Telephone: 913-2	296-5545. Send o	one to WATER WELL (OWNER and retain	one for your records	S.

1 LOCATIO			AVAIL	R WELL RECORD F	orm WWC-	5 KSA 82a	-1212	
<u></u>	ON OF WAT		Fraction		Se	ction Number	Township Numbe	r Range Number
Looding.	DOUGLA	and a second		, NW 1/4 NE	1/4		т 13	S R 20 EN
Distance a	ind direction	from nearest town $2\frac{1}{2}$ miles e		address of well if located	within city?			U
WATER	R WELL OW		el E. Lync					
	Address, Box		J. 9th	-11			Board of Agricul	Iture, Division of Water Resources
1		: Lawre		66044			Application Num	
3 LOCATE	WELL'S LC	CATION WITH	DEPTH OF (COMPLETED WELL 6	i0'	# ELEVA		
AN "X"	IN SECTION							. ft. 3
īΓ	1							tay/yr04/13/98
I	1	1						Irs pumping gpm
-	- NW	NE E						Irs pumping gpm
•	i	I	Bore Hole Diam	eter 10"in. to			and	in. to
Mile M	1	I V	WELL WATER	TO BE USED AS: 5	Public wat	er supply	8 Air conditioning	11 Injection well
ī	- SW	SE	1 Domestic					12 Other (Specify below)
	1	1	-					,
11 L	1	<u> </u>	Was a chemical	bacteriological sample sul	bmitted to D			If yes, mo/day/yr sample was sub-
-	S	and the second sec	nitted				ter Well Disinfected? Y	
		ASING USED:						Glued . X Clamped
1 Ste		3 RMP (SR)		6 Asbestos-Cement				Welded
2 PV		4 ABS		7 Fiberglass				Threaded.
								in. to
		PERFORATION		.in., weight Z . 0.Z	7 P\		10 Asbestos	
1 Ste		3 Stainless		5 Fiberglass		MP (SR)		pecify)
2 Bra		4 Galvanize	d steel	6 Concrete tile	9 AE			ed (open hole)
		ATION OPENING			wrapped			11 None (open hole)
1 Co	ntinuous slot	3 Mill		6 Wire wr	apped		9 Drilled holes	
2 Lou	uvered shutte	er 4 Key	/ punched	7 Torch c	ut		10 Other (specify)	
SCREEN-F	PERFORATE	D INTERVALS:	From	X	XXX	60 ft., Fro	m	. ft. to
0			From	ft. to			m	. ft. to
0	GRAVEL PAC	K INTERVALS:	From			60 ft., Froi	m	. ft. to
			the second state of the se					ft. to ft.
and the second sec				ft., From	ft.			ft. toft.
and address		urce of possible c	ontamination:				to also mana	
	part territ					10 Lives		14 Abandoned water well
		4 Lateral	lines	7 Pit privy		11 Fuel	storage	15 Oil well/Gas well
and the second	wer lines	5 Cess p	lines bool	8 Sewage lagoo	n	11 Fuel 12 Fertili	storage zer storage	
3 Wa	atertight sewe	5 Cess p er lines 6 Seepag	lines bool		n	11 Fuel 12 Fertili 13 Insec	storage zer storage ticide storage	15 Oil well/Gas well
3 Wa Direction fr	atertight sewe	5 Cess p	lines bool ge pit	8 Sewage lagoo 9 Feedyard		11 Fuel 12 Fertili 13 Insec How ma	storage izer storage ticide storage ny feet? 100 '	15 Oil well/Gas well 16 Other (specify below)
3 Wa Direction fr FROM	atertight sewe rom well? TO	5 Cess p er lines 6 Seepa East	lines bool	8 Sewage lagoo 9 Feedyard	n FROM	11 Fuel 12 Fertili 13 Insec	storage izer storage ticide storage ny feet? 100 '	15 Oil well/Gas well
3 Wa Direction fr	atertight sewe	5 Cess p 6 Seepa East Top Soil	lines pool ge pit LITHOLOGIC	8 Sewage lagoo 9 Feedyard		11 Fuel 12 Fertili 13 Insec How ma	storage izer storage ticide storage ny feet? 100 '	15 Oil well/Gas well 16 Other (specify below)
3 Wa Direction fr FROM 0	rom well? TO 3 23	5 Cess p 6 Seepa East Top Soil Clay-Brow	lines bool ge pit LITHOLOGIC m-Silty	8 Sewage lagoo 9 Feedyard		11 Fuel 12 Fertili 13 Insec How ma	storage izer storage ticide storage ny feet? 100 '	15 Oil well/Gas well 16 Other (specify below)
3 Wa Direction fr FROM 0 3	atertight sewe rom well? TO 3	5 Cess p 6 Seepa East Top Soil Clay-Brow Clay-Dark	lines pool ge pit LITHOLOGIC m-Silty Brown	8 Sewage lagoo 9 Feedyard		11 Fuel 12 Fertili 13 Insec How ma	storage izer storage ticide storage ny feet? 100 '	15 Oil well/Gas well 16 Other (specify below)
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County:	IN OF WA	FER WELL:	Fraction			orm WWC	ection Number	Tow	nship Num	ber	Ran	nge Num	nber
	DOUGLA		SW 1/4		1/4 SW	1/4	12	Т	13	S	R	20	E/M
Distance an	d direction	from nearest town			ell if located	within city'	?				1. A.	1.13.18	
-		1 3/4 west	t of Eudora	a									
WATER	WELL OW	NER: Jeff Ga	azaway										1.14
#, St. Ac	ddress, Bo	× # : 15007 V	W. 85th Ter	rrace	(File ;	#40333)		Во	ard of Agri	iculture, D	Division of	Water F	Resour
		: Lenexa,							plication N				
LOCATE	WELL'S L	OCATION WITH 4	DEPTH OF CO	MPLETED	WELL 68	3	ft. ELEVA	TION:					
- AN X II	N SECTION		epth(s) Groundw										
ā T		N I	VELL'S STATIC V	VATER LE	VEL	2.7. ' ft.	below land sur	face meas	ured on m	o/day/yr	. 8-23	3-91	
	- NW	NE					ft. af						
	1	1 E	st. Yield 300.										
W W	1.	I F B	ore Hole Diamete	er22.".	in. to		ft., a	and		in.	to		
Σ "			VELL WATER TO	BE USED			ter supply	8 Air cond	ditioning	11	njection w	vell	
ī	- SWX	SE	1 Domestic	3 Fee	dlot 6	Oil field w	ater supply	9 Dewate	ring	12 (Other (Spe	ecify bel	ow)
	1	T I	2 Irrigation	4 Indu	ustrial 7	Lawn and	garden only 1	10 Monitor	ing well				
+ L	1	N 1	Vas a chemical/ba	cteriologica	al sample su	bmitted to I	Department? Ye	9S	NoX	; If yes,	mo/day/yr	r sample	was s
- 	S	the second s	nitted				Wat		sinfected?			No	
_		ASING USED:		5 Wrought			rete tile		ING JOINT				
1 Stee		3 RMP (SR)			-Cement		r (specify below	'		12	d.X		
2 PVC		4 ABS	0 50	7 Fiberglas	S	*****		• • • • • • •	· • •	Threa	ded		
Blank casing	g diameter	<u>1</u> 2"in	. to	P ft., Di	a	in. t	0	ft., Dia	1	İ	n. to		• • • •
		ind surface		n., weight .								?	
		R PERFORATION				7 P			10 Asbest				
1 Stee		3 Stainless s	the second secon	5 Fiberglas					11 Other			• • • • • •	
2 Bras		4 Galvanized ATION OPENINGS		6 Concrete	tile	9 A			12 None i				
	tinuous slo				5 Gauzed	wrapped	Johnson	8 Saw c			11 None	e (open h	nole)
	vered shutt		punched		6 Wire wr 7 Torch c		.125	9 Drillec					
		D INTERVALS:	From 5.8 .				# From		(specify)				
		D INTERVALO.	From										
GF	AVEL PA		- 25							11. 10			
		CK INTERVALS:	From. 20		ft to	68	ft Fron	n		ft to			
		CK INTERVALS:				. 68	ft., Fron	n					••••
			From		ft. to	6.8	ft., Fron ft., Fron	n n		ft. to)		
GROUT N	MATERIAL	1 Neat cer	From ment 2	Cement gr	ft. to		ft., Fron ft., Fron	n n Other		ft. to			
GROUT M	MATERIAL als: Fror	: 1 <u>Neat cer</u> nft.	From 2 nent 2 to25	Cement gr	ft. to rout om		ft., From ft., From conite 4 (to	n n Other ft., . f		<u>ft. to</u>	. ft. to .		
6 GROUT M Grout Interva	MATERIAL als: Fror nearest so	1 Neat cer	From 2 nent 2 to25	Cement gr	ft. to rout om		ft., From ft., From conite 4 (to	n n Other ft., f ock pens		ft. to	. ft. to .	water w	
6 GROUT M Grout Interva What is the 1 Sept	MATERIAL als: Fror nearest so	n 1 <u>Neat cer</u> n 1 <u>Neat cer</u> n 1 urce of possible co	From 2 ment 2 to25 ontamination: lines	Cement gr ft., Fro 7 Pit	ft. to rout om		ft., Fron ft., Fron conite 4 (to 10 Livest 11 Fuel s	n n Other ft., f ock pens	-rom	ft. to 14 Ab 15 Oil	, ft. to . pandoned	water w s well	 ell
GROUT M Grout Interva What is the <u>1 Sept</u> 2 Sewe	MATERIAL als: Fror nearest so tic tank er lines	n 1 <u>Neat cer</u> n 0 ft. urce of possible co 4 Lateral	From 2 nent 2 to25 ontamination: lines pol	Cement gr ft., Fro 7 Pit 8 Se	ft. to rout om		toft., Fron to.nite 4 (to 10 Livest 11 Fuel s 12 Fertiliz	n n Other ft., f ock pens storage		ft. to 14 Ab 15 Oil 16 Ot	, ft. to . pandoned well/Gas	water w s well ify below	v)
GROUT M Grout Interva What is the 1 Septi 2 Sewa 3 Wate	MATERIAL als: Fror nearest so ic tank er lines ertight sew	: 1 <u>Neat cer</u> n0ft. urce of possible co 4 Lateral 5 Cess po	From 2 nent 2 to25 ontamination: lines pol	Cement gr ft., Fro 7 Pit 8 Se	ft. to rout om t privy ewage lagoo		toft., Fron to.nite 4 (to 10 Livest 11 Fuel s 12 Fertiliz	nn Other ock pens storage zer storage icide stora		ft. to 14 Ab 15 Oil 16 Ot	, ft. to . bandoned I well/Gas her (spec	water w s well ify below	v)
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6 GROUT M Grout Interva What is the 1 Septi 2 Sewa 3 Wate Direction from	MATERIAL als: Fror nearest so tic tank er lines ertight sew m well? TO 3	n 1 <u>Neat cer</u> n 0 ft. urce of possible co 4 Lateral 5 Cess po er lines 6 Seepag west Top Soil	From 2 to25 Intamination: lines col e pit	Cement gr ft., Fro 7 Pit 8 Se 9 Fe	ft. to rout om t privy ewage lagoo	<u>68</u> 3 Bent ft. n	to	nn Other ock pens storage zer storage icide stora	From ge 420 '	ft. to 14 Ab 15 Oil 16 Ot	, ft. to , pandoned I well/Gas her (spec	water w s well ify below	v)
6 GROUT M Grout Interva What is the 1 Septi 2 Sewa 3 Wate Direction from FROM 0 3	MATERIAL als: Fror nearest so tic tank er lines ertight sew m well? TO 3 29	n 1 <u>Neat cer</u> n 0 ft. urce of possible co 4 Lateral 5 Cess po er lines 6 Seepag west Top Soil Clay-Brown	From 2 to25 Intamination: lines col e pit	Cement gr ft., Fro 7 Pit 8 Se 9 Fe	ft. to rout om t privy ewage lagoo	<u>68</u> 3 Bent ft. n	to	nn Other ock pens storage zer storage icide stora	From ge 420 '	ft. to 14 Ab 15 Oil 16 Ot	, ft. to , pandoned I well/Gas her (spec	water w s well ify below	v)
6 GROUT M Grout Interva What is the 1 Septi 2 Sewa 3 Wate Direction from FROM 0 3 29	MATERIAL als: Fror nearest so tic tank er lines ertight sew m well? TO 3 29 49	in 1 <u>Neat cer</u> n 0 ft. urce of possible co 4 Lateral 5 Cess po er lines 6 Seepag west Top Soil Clay-Brown Clay-Blue	From 2 to25 ontamination: lines col e pit LITHOLOGIC LC	Cement gr ft., Fro 7 Pit 8 Se 9 Fe	ft. to rout om t privy ewage lagoo	<u>68</u> 3 Bent ft. n	to	nn Other ock pens storage zer storage icide stora	From ge 420 '	ft. to 14 Ab 15 Oil 16 Ot	, ft. to , pandoned I well/Gas her (spec	water w s well ify below	v)
6 GROUT M Grout Interva What is the 1 Septi 2 Sewa 3 Wate Direction from FROM 0 3 29 49	MATERIAL als: Fror nearest so tic tank er lines ertight sew m well? TO 3 29 49 50	in 1 <u>Neat cer</u> n 0 ft. urce of possible co 4 Lateral 5 Cess po er lines 6 Seepag west Top Soil Clay-Brown Clay-Blue Fine Sand-	From 2 to25 ontamination: lines bol e pit LITHOLOGIC LC	Cement gr ft., Fro 7 Pit 8 Se 9 Fe DG	ft. to rout om t privy ewage lagoo	<u>68</u> 3 Bent ft. n	to	nn Other ock pens storage zer storage icide stora	From ge 420 '	ft. to 14 Ab 15 Oil 16 Ot	, ft. to , pandoned I well/Gas her (spec	water w s well ify below	v)
6 GROUT M Grout Interva What is the 1 Septi 2 Sewa 3 Wate Direction from FROM 0 3 29 49 50	MATERIAL als: From nearest so tic tank er lines ertight sew m well? TO 3 29 49 50 51	in 1 <u>Neat cer</u> n 0 ft. urce of possible co 4 Lateral 5 Cess po er lines 6 Seepag west Top Soil Clay-Brown Clay-Blue Fine Sand- FS-CS-Med-	From 2 to25 ontamination: lines col e pit LITHOLOGIC LC	Cement gr ft., Fro 7 Pit 8 Se 9 Fe DG	ft. to rout om t privy ewage lagoo	<u>68</u> 3 Bent ft. n	to	nn Other ock pens storage zer storage icide stora	From ge 420 '	ft. to 14 Ab 15 Oil 16 Ot	, ft. to , pandoned I well/Gas her (spec	water w s well ify below	v)
6 GROUT N Grout Interva What is the 1 Septi 2 Sewa 3 Wate Direction fro FROM 0 3 29 49 50 51	MATERIAL als: From nearest so tic tank er lines ertight sew m well? TO 3 29 49 50 51 53	in 1 <u>Neat cer</u> n 0 ft. urce of possible co 4 Lateral 5 Cess po er lines 6 Seepag west Top Soil Clay-Brown Clay-Blue Fine Sand- FS-CS-Med- Clay-Blue	From 2 to25 ontamination: lines bol e pit LITHOLOGIC LC D -Blue -Gravel-Blu	Cement gr ft., Fro 7 Pit 8 Se 9 Fe DG 100 100	ft. to rout com	<u>68</u> 3 Bent ft. n	to	nn Other ock pens storage zer storage icide stora	From ge 420 '	ft. to 14 Ab 15 Oil 16 Ot	, ft. to , pandoned I well/Gas her (spec	water w s well ify below	v)
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6 GROUT M Grout Interva What is the 1 Septi 2 Sewa 3 Wate Direction from FROM 0 3 29 49 50 51 53 56	MATERIAL als: Fror nearest so tic tank er lines ertight sew m well? TO 3 29 49 50 51 53 56 68	in 1 <u>Neat cer</u> n 0 ft. urce of possible co 4 Lateral 5 Cess po er lines 6 Seepag west Top Soil Clay-Brown Clay-Brown Clay-Blue Fine Sand- FS-CS-Med- Clay-Blue FS-CS-Med- IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	From 2 to25 ontamination: lines bool e pit LITHOLOGIC LC -Blue -Gravel-Blu -Pea Gravel " " (Cement gr ft., Fro 7 Pit 8 Se 9 Fe DG 	ft. to rout com	6.8 3 Bent ft. n FROM	to	nn Other ock pens storage zer storage icide stora	From ge 420 '	ft. to 14 Ab 15 Oil 16 Ot	, ft. to , pandoned I well/Gas her (spec	water w s well ify below	v)
6 GROUT N Grout Interva What is the 1 Septi 2 Sewa 3 Wate Direction from FROM 0 3 29 49 50 51 53	MATERIAL als: Fror nearest so tic tank er lines ertight sew m well? TO 3 29 49 50 51 53 56	in 1 <u>Neat cer</u> n 0 ft. urce of possible co 4 Lateral 5 Cess po er lines 6 Seepag west Top Soil Clay-Brown Clay-Blue Fine Sand- FS-CS-Med- Clay-Blue FS-CS-Med-	From 2 to25 ontamination: lines bool e pit LITHOLOGIC LC -Blue -Gravel-Blu -Pea Gravel " " (Cement gr ft., Fro 7 Pit 8 Se 9 Fe DG 	ft. to rout com	6.8 3 Bent ft. n FROM	to	nn Other ock pens storage zer storage icide stora	From ge 420 '	ft. to 14 Ab 15 Oil 16 Ot	, ft. to , pandoned I well/Gas her (spec	water w s well ify below	v)
6 GROUT N Grout Interva What is the 1 Septi 2 Sewa 3 Wate Direction from FROM 0 3 29 49 50 51 53 56	MATERIAL als: Fror nearest so tic tank er lines ertight sew m well? TO 3 29 49 50 51 53 56 68	in 1 <u>Neat cer</u> n 0 ft. urce of possible co 4 Lateral 5 Cess po er lines 6 Seepag west Top Soil Clay-Brown Clay-Brown Clay-Blue Fine Sand- FS-CS-Med- Clay-Blue FS-CS-Med- IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	From 2 to25 ontamination: lines bool e pit LITHOLOGIC LC -Blue -Gravel-Blu -Pea Gravel " " (Cement gr ft., Fro 7 Pit 8 Se 9 Fe DG 	ft. to rout com	6.8 3 Bent ft. n FROM	to	nn Other ock pens storage zer storage icide stora	From ge 420 '	ft. to 14 Ab 15 Oil 16 Ot	, ft. to , pandoned I well/Gas her (spec	water w s well ify below	v)
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WATER WELL RECORD Form WWC-5 KSA 82a-1212 ID No. 1 LOCATION OF WATER WELL: Range Number Fraction Section Number Township Number County: Douglas 1/2 SW 1/2 31 12 21 Т S R (EW Distance and direction from nearest town or city street address of well if located within city? **REF: Don Westheffer** WATER WELL OWNER: Nunemaker-Ross Inc. RR#, St. Address, Box # : 1616 North 1700 Road Board of Agriculture, Division of Water Resources City, State, ZIP Code : Lawrence, Ks 66044 46589 Application Number: 3 LOCATE WELL'S LOCATON WITH 4 DEPTH OF COMPLETED WELL 50 ft. ELEVATION: Depth(s) Groundwater Encountered 1______ft. 2_____ft. 3_____ft. 5 WELL'S STATIC WATER LEVEL **Na** ft. below land surface measured on mo/day/yr Pump test data: Well water was ft. after hours pumping gpm NE -NIN Est. Yieldgpm:Well water wasft. afterhours pumpinggpmBore Hole Diameter28in. to51ft. andin. toft.WELL WATER TO BE USED AS:5Public water supply8Air conditioning11Injection well1Domestic3Feed lot6Oil field water supply9Dewatering12Other (Specify below) Bore Hole Diameter 28 in. to P R W E SF --SW-2 Irrigation 4 Industrial 7 Lawn and garden (domestic) 10 Monitoring well х Was a chemical/bacteriological sample submitted to Department? Yes No X If yes, mo/day/yr sample was submitted Water Well Disinfected? Yes X No 5 TYPE OF BLANK CASING USED: 5 Wrought Iron 8 Concrete tile CASING JOINTS: Glued X Clamped

 1
 Steel
 3
 RMP (SR)
 0
 Assesses construction

 2
 PVC
 4
 ABS
 7
 Fiberglass
 Threaded

 Blank casing diameter
 28
 in. to
 30
 ft., Dia
 in. to
 ft., Dia
 in. to
 ft.

 Casing height above land surface
 24
 in., weight
 16.15
 lbs./ft. Wall thickness or gauge No.
 .500

 TYPE OF SCREEN OR PERFORATION MATERIAL:
 7
 PVC
 10
 Asbestos-cement

 1
 Steel
 3
 Stainless steel
 5
 Fiberglass
 8
 RMP (SR)
 11
 Other (specify)

 1
 Steel
 3
 Stainless steel
 5
 Fiberglass
 8
 RMP (SR)
 11
 Other (specify)

 1
 None used (open hole)
 11
 None (open hole)
 11
 None (open hole)

 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below)

 FORATION MATERIAL:

 3 Stainless steel
 5 Fiberglass
 8 RMP (Srs)

 4 Galvanized steel
 6 Concrete tile
 9 ABS
 12 None used (open hole)

 N OPENINGS ARE:
 5 Gauzed wrapped
 8 Saw cut
 11 None (open hole)

 2 Multiclot
 6 Wire wrapped
 9 Drilled holes

 7 Multiclot
 6 Wire wrapped
 9 Drilled holes

 7 Torch cut
 10 Other (specify)

 2 Brass SCREEN OR PERFORATION OPENINGS ARE:
 1 Continuous slot
 3 Mill slot

 2 Louvered shutter
 4 Key punched
 CREEN-PERFORATED INTERVALS: From 30 ft. to 50 ft. From ft. to ft.
 From
 ft. to
 ft. From
 ft. to
 ft. to

 From
 20
 ft. to
 50
 ft. From
 ft. to
 ft.
 GRAVEL PACK INTERVALS: ft. From ft. to ft. to ft. From 6 GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other 0 ft. to 20 ft. From ft. to ft. From ft. to ft. Grout Intervals From
 10
 Livestock pens
 14
 Abandoned water well

 11
 Fuel storage
 15
 Oil well/ Gas well
 What is the nearest source of possible contamination: 1 Septic tank 4 Lateral lines 7 Pit privy 16 Other (specify below) 8 Sewage lagoon 12 Fertilizer storage 2 Sewer lines 5 Cess pool 13 Insecticide storage 3 Watertight sewer lines 6 Seepage pit 9 Feedyard none Direction from well? How many feet? LITHOLOGIC LOG CODE FROM PLUGGING INTERVALS FROM TO TO Surface 0 3 Clay 3 24 Sand & gravel 24 35 35 50 Large gravel 50 51 shale / CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/yr) 5-13-07 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 554 This Water Well Record was completed on (mo/day/yr) ,3-30-07 r the business name of Woofter Pump & Well Inc. by (signature) may C W with M M M R INSTRUCTIONS: Please fill in blanks and circle the correct answers. Send three copies to Kansas Department of Health and Environment, Bureau of Water, 1000 S W Jackson St., Ste. 420, Topeka, Kansas 66612-1367. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records. under the business name of



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Kansas Geological Survey Comments to webadmin@kgs.ku.edu

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2 Louv SCREEN- Grout Inte What is th 1 Sept 2 Sew 3 Wate Direction FROM 0 11 18 22 27 33 35 38 42	vered shutt -PERFORA GRAVEL F MATERIA ervals: Fro he nearest tic tank ver lines tertight sew from well? TO 11 18 22 27 33 35 38 42 49	Area 4 Key Area INTERVALS PACK INTERVALS ACK INTERVALS AL: 1 Neat cer om. 0 source of possibl 4 Latera 5 Cess p er lines 6 Seepa LI brown si brown si brown fs grey fir blue cla grey fs- blue cla	y punched S: From From S: From From ment ft. to2. e contaminati l lines pool ge pit ITHOLOGIC i 1 ty c1 i 1 t S-CS S-CS-me ne sand ay -cs-med ay ed-some	50 25f 2 Ceme 5f ion: LOG ay d-pea grave pea	7 Torcl ft. to ft. to ft. to ft. to mt grout t., From 7 Pit privy 8 Sewage 9 Feedyau 9 Feedyau	a cut 6.3 3 Bentor ft lagoon rd	tt., Fron tt., Fron tt., Fron tt., Fron nite 4 to 10 Lives 11 Fuel 12 Fertil 13 Insec How ma	10 Other n	(specify)	ft. ft. ft. ft. ft. ft. 14 A 15 C 16 C Open.	to to.	ned water v Gas well specify belo 1 d	well
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2 Louv SCREEN- Grout Inte What is th 1 Sept 2 Sew 3 Wate Direction FROM 0 1 1 1 8 22 27 33 35 38 42 49 54	vered shutt -PERFORA GRAVEL F MATERIA ervals: Fro he nearest tic tank ver lines tic tank ver lines tic tank from well? TO 11 18 22 27 33 35 38 42 49 54 55	ATED INTERVALS PACK INTERVALS ACK	y punched S: From From S: From From ment ft. to2. te contaminati l lines pool ge pit ITHOLOGIC i 1 ty c1 i 1 t S-CS S-CS-me ne sand ay -CS-med ay ed-some ay	50 25f 2 Ceme 5f ion: LOG ay d-pea grave pea	7 Torcl ft. to ft. to ft. to ft. to mt grout t., From 7 Pit privy 8 Sewage 9 Feedyau 9 Feedyau	a cut 6.3 3 Bentor ft lagoon rd	tt., Fron tt., Fron tt., Fron tt., Fron nite 4 to 10 Lives 11 Fuel 12 Fertil 13 Insec How ma	10 Other n	(specify)	ft. ft. ft. ft. ft. ft. 14 A 15 C 16 C Open.	to to.	ned water v Gas well specify belo 1 d	well
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INSTRUCTIONS: Use typewriter or ball point pen. PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone 785-296-5524. Send one to WATER WELL OWNER and retain one for your records. Fee of \$5.00 for each constructed well.

			WATE	ER WELL RECORD	Form WWC-5	KSA 82a-	1212	
1 LOCATI	ON OF WA	FER WELL:	Fraction		Sec	ion Number	Township Number	Range Number
	DOUG		SEV	A NW 1/4 NE	- 1/4	6	T 13 S	R 21 (E)W
				address of well if located				
	3 MIL			F EUDORA				
			OFEVI					hand a second second second second second second second second second second second second second second second
	R WELL OW	NER: CITY	TEVE	WTH STREET				D
	Address, Bo	x # : 4 EA	SI SEVU	11-21			• · ·	Division of Water Resources
	, ZIP Code		DRA, KS		Statute of the second			
3 LOCATE	E WELL'S L							
AN "X"	IN SECTIO	N BOX:	Depth(s) Ground	dwater Encountered 1		ft. 2		3 ,
Γ.	1							r 6/16/9.8
11	1							umping
	- NW	NE						umping
								n. to
Wile W		Trementation of the contract o			and the second se		B Air conditioning 11	
2								
1 -	- SW	SE	1 Domestic	3 Feedlot	6 Oil field wat	er supply	9 Dewatering 12	Other (Specify below)
	1	1	2 Irrigation					
	1	1			submitted to De	The second second second second second second second second second second second second second second second se		s, mo/day/yr sample was sub-
T		5	mitted 4	4/21/97			er Well Disinfected? (Yes)	
5 TYPE C	OF BLANK	CASING USED:		5 Wrought iron	8 Concre	te tile	CASING JOINTS: Glue	ed Clamped
1. Ste	eel	3 RMP (SR	R)	6 Asbestos-Cement	9 Other	specify below) Wel	ded X
		4 ABS		7 Fiberglass			Thre	eaded
Blank casi	na diameter	12	in. to	7 ft Dia	in, to		ft Dia	eadedft.
Casing he	ight above l	and surface	18	in weight PITL	ESS UNI	T lbs/f	t Wall thickness or gauge I	No. 0, 375"
		R PERFORATION		int., worgin	7 PV		10 Asbestos-cerr	
		-	and the second se	5 Fiberglass		P (SR)		/)
1 Ste							12 None used (o	
2 Bri		4 Galvanize			0 112			
		RATION OPENING		the second second second second second second second second second second second second second second second se	ed wrapped			11 None (open hole)
1 Cc	ontinuous sk				wrapped		9 Drilled holes	
2 Lo	ouvered shut	ter 4 Ke	ey punched	イフ 7 Torch	cut		10 Other (specify)	
CREEN-	PERFORAT	ED INTERVALS:						toft.
-								toft.
0	GRAVEL PA	CK INTERVALS:	From		7.2	ft., Fron	n ft.	toft.
0.00.00%			From	ft. to		ft., Fron	n ft.	to ft.
6 GROUT	T MATERIA	. 1 Neat c	ement)				Other	
Grout Inte	rvals: Fro	m	ft. to Z.C					ft. to
		ource of possible of				10 Livest		Abandoned water well
	eptic tank	4 Latera		7 Pit privy		11 Fuel s		Oil well/Gas well
	ewer lines			8 Sewage lag	000			
		ver lines 6 Seepa		9 Feedvard	0011			Other (specify below)
1.		ver lines o deepe	age pir	5 Teeuyaru		10 113000		Other (specify below)
FROM	from well? TO					Llow more	icide storage	Other (specify below)
FRUM		1			EPOM	How mar	iy feet?	
h		TOP 5	LITHOLOGIC	LOG	FROM	How mar TO	iy feet?	Other (specify below)
0	2		OIL		FROM		iy feet?	
2	2	BROWN	DIL SANDY S		FROM		iy feet?	
2	2 17 23	BROWN M	OIL SANDY J EDIVM TO	FINE STAND			iy feet?	
2 17 23	2 17 23 38	BROWN M	OIL SANDY J EDIVM TO	FINE STAND			iy feet?	
2 17 23	2 17 23 38 55	BROWN BROWN M GRAY MEDIU GRAY MEDIU	OIL SANDY S EDIVM TO UM TO CE M TO COA	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL			iy feet?	
2	2 17 23 38	BROWN M	OIL SANDY S EDIVM TO UM TO CE M TO COA	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL			iy feet?	
2 17 23	2 17 23 38 55	BROWN BROWN M GRAY MEDIU GRAY MEDIU	OIL SANDY S EDIVM TO UM TO CE M TO COA	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL			iy feet?	
2 17 23	2 17 23 38 55	BROWN BROWN M GRAY MEDIU GRAY MEDIU	OIL SANDY S EDIVM TO UM TO CE M TO COA	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL			iy feet?	
2 17 23	2 17 23 38 55	BROWN BROWN M GRAY MEDIU GRAY MEDIU	OIL SANDY S EDIVM TO UM TO CE M TO COA	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL			iy feet?	
2 17 23	2 17 23 38 55	BROWN BROWN M GRAY MEDIU GRAY MEDIU	OIL SANDY S EDIVM TO UM TO CE M TO COA	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL			iy feet?	
2 17 23	2 17 23 38 55	BROWN BROWN M GRAY MEDIU GRAY MEDIU	OIL SANDY S EDIVM TO UM TO CE M TO COA	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL			iy feet?	
2 17 23	2 17 23 38 55	BROWN BROWN M GRAY MEDIU GRAY MEDIU	OIL SANDY S EDIVM TO UM TO CE M TO COA	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL			iy feet?	
2 17 23	2 17 23 38 55	BROWN BROWN M GRAY MEDIU GRAY MEDIU	OIL SANDY S EDIVM TO UM TO CE M TO COA	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL			iy feet?	
2 17 23	2 17 23 38 55	BROWN BROWN M GRAY MEDIU GRAY MEDIU	OIL SANDY S EDIVM TO UM TO CE M TO COA	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL			iy feet?	
2 17 23	2 17 23 38 55	BROWN BROWN M GRAY MEDIU GRAY MEDIU	OIL SANDY S EDIVM TO UM TO CE M TO COA	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL			iy feet?	
2 17 23 38 55	2 17 23 38 55 72	BROWN BROWN M GRAY MEDIU GRAY MEDIU GRAY COAR	OIL SANDY S EDIVM TO UM TO CE M TO COA SE TO MEDI	FILT FINE STAND DARSE, SOME FINE RSE, SOME GRAVEL		TO	ny feet? PLUGGING	INTERVALS
2 17 23 38 55	2 17 23 38 55 72	BROWN BROWN M GRAY MEDIU GRAY MEDIU GRAY COAR	OIL SANDY S EDIVM TO UM TO CE M TO COA SE TO MEDI	FILT FINE SAND DARSE, SOME FINE RSE, SOME GRAVEL IUM		TO TO Cted) (2) reco	ny feet? PLUGGING	INTERVALS
2 17 23 38 55	2 17 23 38 55 72 RACTOR'S on (mo/day	BROWN BROWN M GRAY MEDIU GRAY MEDIU GRAY COAR GRAY COAR	OIL SANDY S EDIVM TO UM TO COA SE TO MEDI SE TO MEDI	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL IUM		TO TO (2) reco and this recol	ny feet? PLUGGING	INTERVALS
2 17 2.3 38 55 CONTI completed Water We	2 17 23 38 55 72 RACTOR'S on (mo/day II Contractor	BROWN BROWN M GRAY MEDIN GRAY MEDIN GRAY COAR GRAY COAR (year) 's License No.	DIL SANDY S EDIVM TO UM TO CO M TO COA SE TO MEDI SE TO MEDI SE CERTIFICAT I 6/9.8 102	FILT FINE SAND DARSE, SOME FINE RSE, SOME GRAVEL IVM		TO TO Cted (2) reco and this records s completed of	ny feet? PLUGGING PLUGGING PLUGGING PLUGGING (In the set of the set of my k particular (mo/day/yr) 8.154	INTERVALS
2 17 2.3 38 55 CONTI completed Water We	2 17 23 38 55 72 RACTOR'S on (mo/day II Contractor	BROWN BROWN M GRAY MEDIN GRAY MEDIN GRAY COAR GRAY COAR (year) 's License No.	DIL SANDY S EDIVM TO UM TO CO M TO COA SE TO MEDI SE TO MEDI SE CERTIFICAT I 6/9.8 102	FINE SAND PARSE, SOME FINE RSE, SOME GRAVEL IUM		TO TO (2) reco and this recol	ny feet? PLUGGING PLUGGING PLUGGING PLUGGING (In the set of the set of my k particular (mo/day/yr) 8.154	INTERVALS

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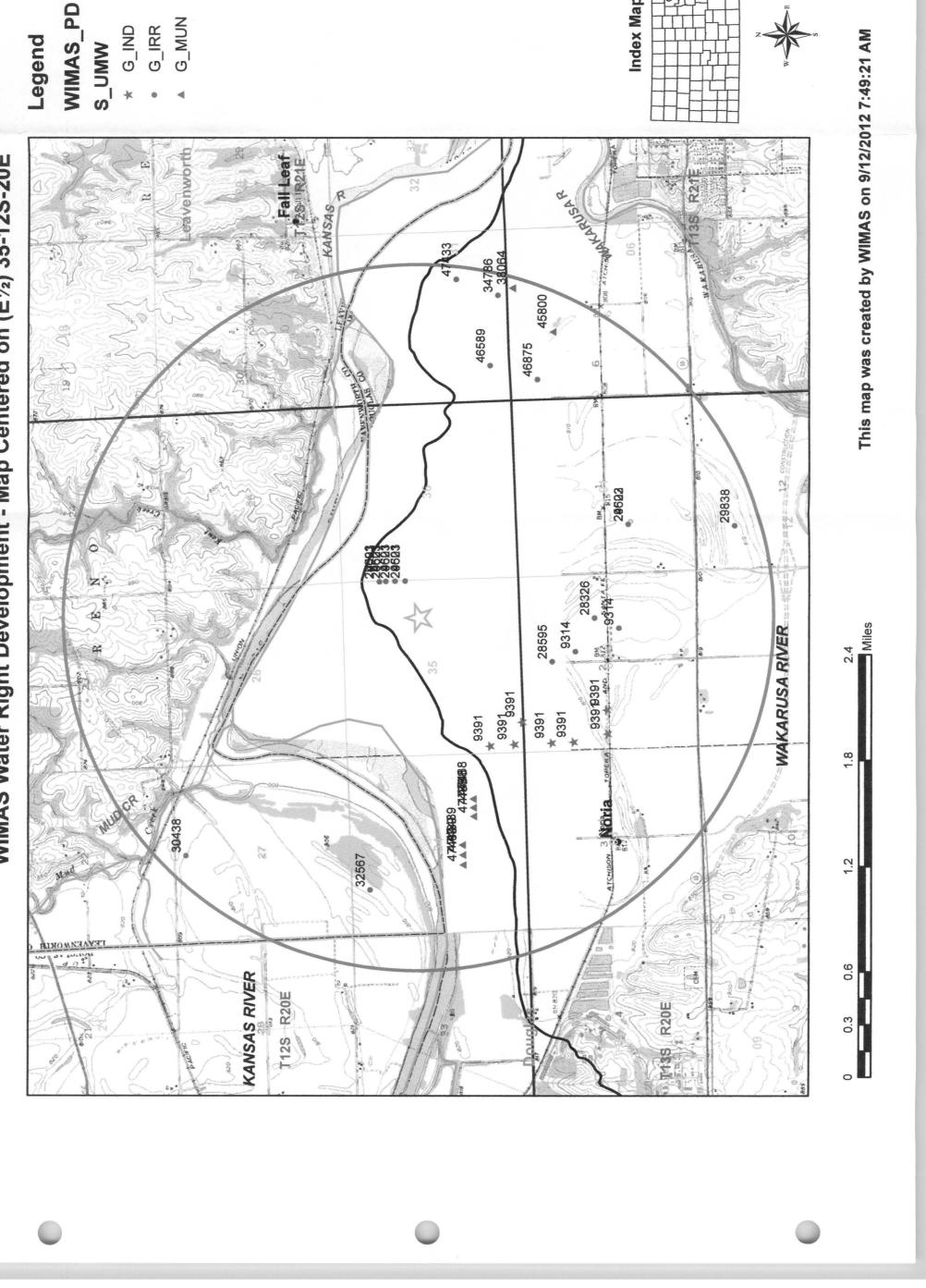
APPENDIX II.

Kansas Department of Agriculture, Division of Water Resources,

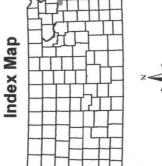
Safe Yield Analysis Data

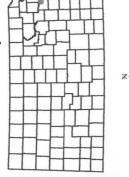


G_MUN









Water Rights and Points of Diversion Within 2.00 miles of point defined as:

2940 ft N and 1320 ft W of the SE Corner of Section 35, T 12S, R 20E Located at: 95.153247 West Longitude and 38.964996 North Latitude GROUNDWATER ONLY

	======		****					===												********	
File	Number		Use	ST	SR	Dist	(mi)	Q4	Q3	Q2	Q1	FeetN	FeetW	Sec	Twp	Rng	ID	Batt 1	Auth_Quan	Add_Quan	Unit
A	9314	00	IRR	NK	G		1.12		NE	NW	SE			2	13	20E	1		102.00	102.00	AF
Same							.89		NW	SW	NE			2	13	20E	2				
A	9391	00	IND	NK	G		.87		SW	SW	SW	283	5040	35	12	20E	1		3685.91	3685.91	AF
Same							.80		SE	SW	SW	24	4375	35	12	20E	8				
Same							.80		NW	SW	SW	1004	5063	35	12	20E	9				
Same							1.23					2778	4815	2	13	20E	3				
Same							1.16					2771	4092	2	13	20E	4				
Same							1.09					3794	5028	2	13	20E	5				
Same							1.00					4453	5034	2	13	20E	9				
A	24621	00	IRR	NK	G		.33		SE	NE	NE	4180	50	35	12	20E	4		24.50	24.50	AF
Same							.31		SE	NE	NE	3970	50	35	12	20E	5				
Same							.28		NE	SE	NE	3680	50	35	12	20E	6				
Same							.25		NE	SE	NE	3370	50	35	12	20E	7			•	
A	24623	00	IRR	NK	G		1.30		CW	NE	SW	1960	3840	1	13	20E	1		4.60	4.60	AF
A	28326	00	IRR	NK	G		.98		SW	SE	NE	3040	1315	2	13	20E	7		36.00	36.00	AF
A	28595	00	IRR	NK	G		.77		SW	NW	NE	4350	2580	2	13	20E	8		23.00	.00	AF
A	29502	00	IRR	NK	G		1.30		CW	NE	SW	1960	3840	1	13	20E	1		49.30	49.30	AF
A	29503	00	IRR	NK	G		.33		SE	NE	NE	4180	50	35	12	20E	4		87.50	87.50	AF
Same							.31		SE	NE	NE	3970	50	35	12	20E	5				
Same							.28		NE	SE	NE	3680	50	35	12	20E	6				
Same							.25		NE	SE	NE	3370	50	35	12	20E	7				
A	29838	00	IRR	NK	G		1.86		SE	NW	NW	4070	4000	12	13	20E	1		26.00	26.00	AF
A	30438	00	IRR	NK	G		1.87		NW	WM	NE	4931	2788	27	12	20E	2		44.00	44.00	AF
A	32567	00	IRR	NK	G		1.54					4750	4000	34	12	20E	2		79.00	79.00	AF
A	34786	00	IRR	NK	G		1.92		SE	SW	SE	300	1950	31	12	21E	1		25.00	25.00	AF
A	38064	00	MUN	NK	G		1.98		NE	NW	NE	5180	1855	6	13	21E	3		190.70	141.97	AF
A	45800	00	MUN	LO	G		1.85		SE	SE	NW	3870	3110	6	13	21E	7		245.51	66.01	AF
A	46589	00	IRR	LR	G		1.54		NC	S2	SW	575	3960	31	12	21E	2		150.00	150.00	AF
A	46875	00	IRR	KE	G		1.54		SE	NW	NW	4613	4547	6	13	21E	9		32.00	32.00	AF
A	47433	00	IRR	HK	G		1.97		SE	NW	SE	1530	1428	31	12	21E	6		91.50	91.50	AF
A	47488	00	MUN	HK	G		1.09		SE	NW	SE	1590	1640	34	12	20E	8 (5 2	1290.41	784.16	AF
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A	47489	00	MUN	HK	G		1.34					1953	3046	34	12	20E	5 (3 2	1290.41	.00	AF
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APPENDIX III.

Potential Pollution Sources in the Area

- 1. Septic tank drain fields and cesspools especially in sandy loam soils can be a potential contamination source of the aquifer. Kansas Department of Health and Environment requires all public water supply ells to have at least 20 feet of grout sealed casing at the top of the well to prevent contamination and entry of flow into the well. However, most older domestic wells do not have grout seals to a safe depth below surface thus becoming a potential sources of contamination of the aquifer. There is supposed to be 100 feet separation between a septic tank drain field and a domestic well on a property.
- 2. Cattle or other livestock feeding operation can be a source of pollution to an aquifer, depending on the soil type and depth to static water level, especially if located within the effective radius of influence of a well. The effective radius of influence of a well is dependent upon the pumping rate of the well and aquifer characteristics. Domestic wells have a small effective radius of influence usually less than 50 feet. The effective radius of influence can be one thousand feet or more for an irrigation well or other large capacity well.
- 3. Chemical fertilizer and herbicides applied to corn planted next to the wells as shown next to Eudora Well No. 6 is a potential threat of contamination to the City wells. This threat of contamination is increased with irrigation, especially on sandy soils. Major portions of Hall and Merrick Counties in Nebraska have nitrates nearly double that of the KDHE and EPA regulations for Nitrates in public water supply due to irrigation and chemigation of corn on sandy loam soils similar to the alluvial soils shown in Bulletin 206, Part 2, Ground Water in the Kansas River Valley Junction City to Kansas City, Kansas by Stuart W. Fader. The Newman Terrace clay loam soils offer more protection of the aquifer from fertilizer.
- 4. Abandoned wells or old domestic wells that were drilled long ago with thin wall casing that have corroded through the years and were not grout sealed, can allow storm water runoff to flow directly into the aquifer resulting in direct contamination to the City wells. Such a well may exist west of Eudora Well No. 7 under the old windmill tower in the picture.

WICHITA SAND PIT STUDY

Sedgwick County Department of Environmental Resources organized and conducted much of the efforts to determine which sand pits to study in more detail. The study group obtained assistance from the U.W. Bureau of Reclamation in drilling and installing three (3) monitoring wells around each of six (6) sites selected for study. Funds were obtained for the U.S. Geological Survey to sample and analyze surface water from the pits, ground water from the monitoring wells, and pit bottom sediment at four (4) sites located at the northwest edge of Wichita. The USGS analyzed the water samples for 18 physical and chemical properties, five (5) bacteriological values, 40 inorganic constituents, 118 pesticides and degradate compounds, and 134 organic compounds other than pesticides. The USGS analyzed the bottom sediments for five (5) physical and chemical properties, 45 inorganic constituents, and 32 organic compounds. The four pits in the Phase I sampling were; Barefoot Bay, Ridge Port, Mooring, and Cropland. Later two south pits were sampled which were; Kingston Cove and Pine Bay Estates.

Maize retention pond/ground-water pit is used for storage of storm water runoff. A special sampling of the storm water flow into the pit was made by others within 30 minutes of when flow commenced and within one to two hours following a storm event. The TDS of the storm water flow was very low at 49 to 111 mg/L when compared to the computed values in the analysis of data of 46 to 83 mg/L by the Kansas Geological Survey. Organic compounds found in the runoff water of concern was Alachlor at 3.8 μ g/L in the first June 2007 runoff sample, Alachlor of 3.0 μ g/L in the second June 2007 sample. The drinking water MCL for Alachlor is 2 μ g/L. However, in the October 2007 pond sample Alachlor was significantly reduced by sunlight and bacterial activity of the pond. The Maize detention pond appears to be an effective means of removing storm water runoff with high bacteria content from the Big Slough waterway.

Storm water runoff into the sand pits does contribute to ground water recharge. The study showed no *significant* evidence of contamination of ground water by storm water runoff into the pits. The key word is *significant* contamination. Trace levels of some organics and mineral constituents such as iron, manganese and the ammonium ion were detected in the down gradient monitoring wells in slightly greater concentrations than the up gradient monitoring wells. On the contrary, most organic contaminants were reduced by the sunlight and bacterial activity existing within the sand pit lakes. Bacterial levels were never greater than the level recommended by KDHE for body contact.

Although some of the pits had piped storm water runoff into the pits from streets, broad width flow ways with grass filtering would capture silt and other contaminants prior to entering the ponds or pits. Road side drainage ditches may have a broad width overflow channels into nearby pits temporarily storing the storm water surge allowing orderly flow through natural water courses. The long term accumulation of silts, sediments and other solids will eventually restrict the recharge to the ground water system as has occurred at the Sedgwick County Zoo pit.

Residential areas have the greater potential for ground water contamination than rural areas. However, the spring runoff from corn fields with atrazine must be bounded by grass filter strips and flows need to be routed in grass waterways to capture sediments with atrazine attached.

Hydraulic Impacts of Quarries and Gravel Pits

Prepared by

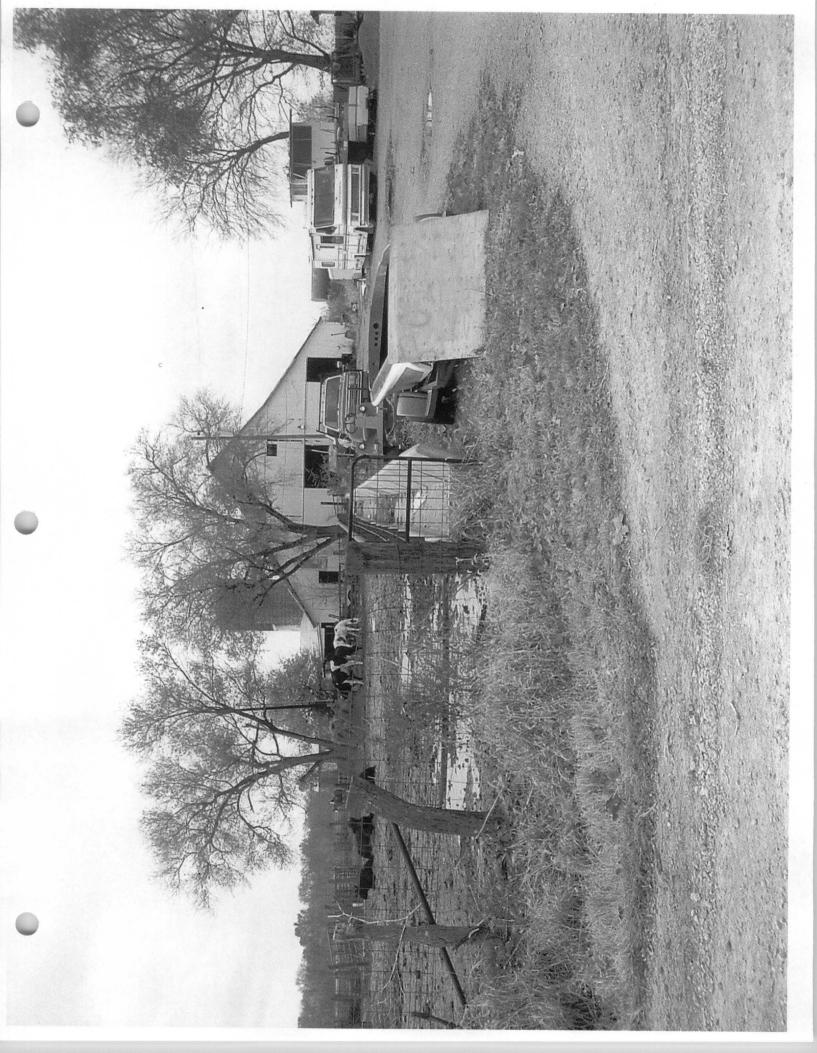
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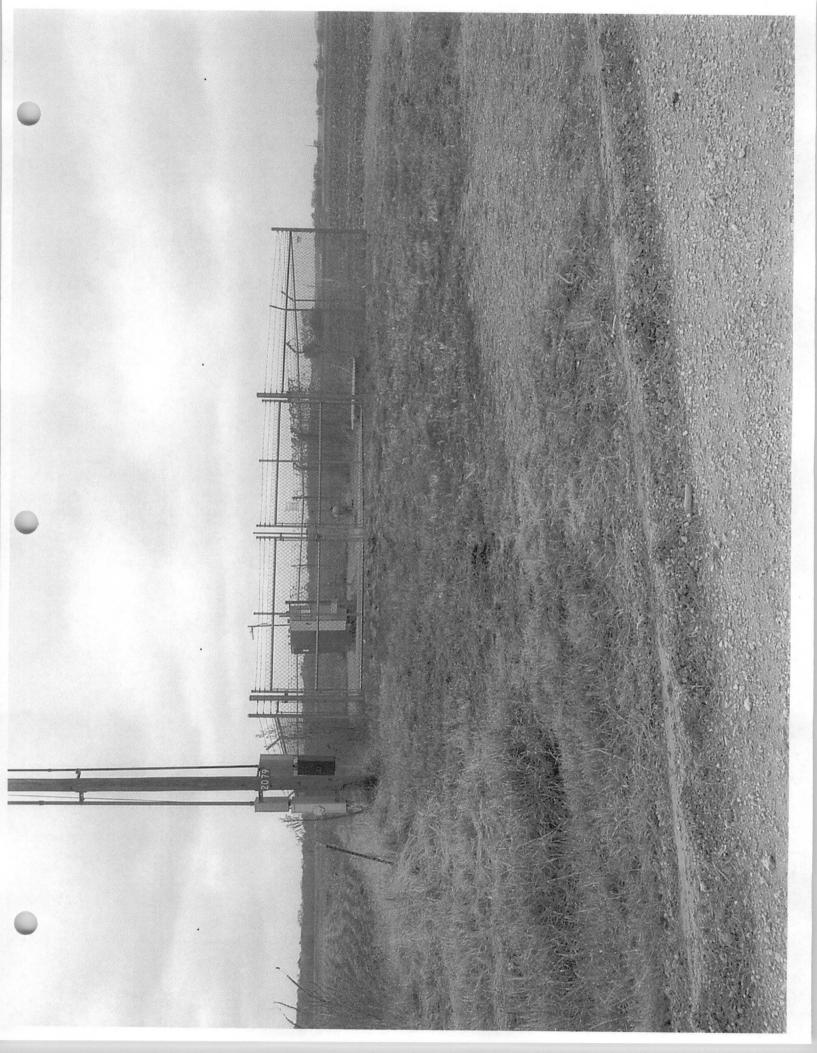
Minnesota Department of Natural Resources

Division of Waters

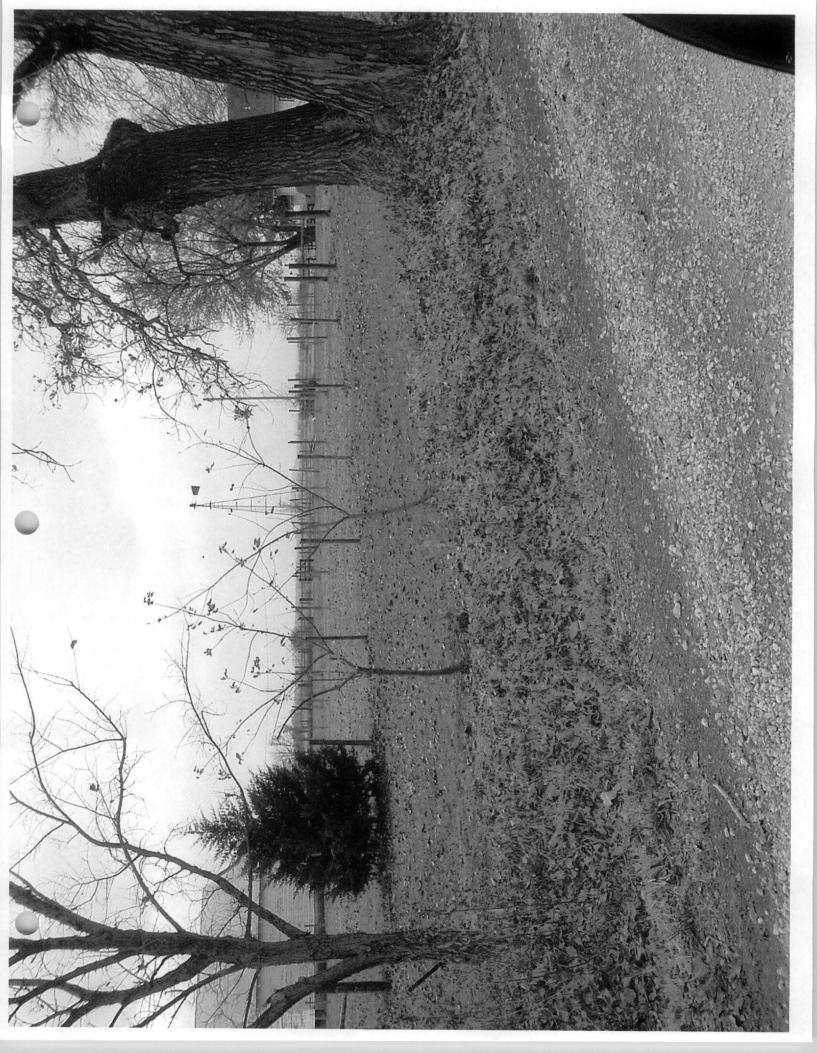
2005

The Division of Waters, MDNR studied three sand pits in the report, two of which were in saturated alluvial sediments and one was above the water table. The conclusion of this study was that sand mining had minimal impact on aquifer water levels. In one sand pit, ground water temperature changes were noted but were not consistent.











APPENDIX IV.

RESUME' AND PERSONAL INFORMATION

Name:

Carl E. Nuzman, P.E., P.Hg. 3314 NW Huxman Road Silver Lake, KS 66539

Phone: (785) 582 4054 Cell: (785) 224 9929 <u>cnuzman@embarqmail.com</u>

Position: Consulting Engineer / Hydrogeologist

Academic and Professional Certifications:

Master of Science in Water Resources Engineering, Department of civil Engineering, University of Kansas, 1955.

Bachelor of Science in Agricultural Engineering, Kansas State University, 1053.

Professional Engineer, first licensed in Kansas in 1962, KS-4481. Formerly licensed in the following states: MO-E12525, IA-6334, SC-4099, FL-15102, AL-16858, AZ-23209, IL-062-043392, IN-PE-60880547, LA-23209, MS-10041, MI-33050, NE-E-12525, NC-15121, NM-10625, OH-E-51179, OK-15653, TN-018707, VA-0402-018380, and WI-E-25841. Professional Hydrogeologist, Certified in 1986 by the American Institute of Hydrology, P.,Hg-385.

Professional Positions:

- Consultant 1997 to Present
- Layne GeoSciences, Inc. Mission Woods, KS, Vice-president and Principal Hydrologist 1988 to 1997
- Groundwater Management, Inc. Kansas city, KS, Vice President and Chief Hydrologist, 1985 to 1988
- Layne Western Company, Inc. Hydrology Division Manager and Chief Hydrologist 1970 to 1985
- Layne Western Company, Inc. Kansas City, MO, Sales Engineer 1967 to 1970
- Kansas Water Resources Board, Topeka, KS, Hydrologist III 1966
- Kansas State Board of Agriculture, Division of Water Resources, Topeka, KS, Assistant Engineer 1957 to 1965

Specialized Competence:

- Surface and ground water hydrology
- Project management and supervision
- Water well treatment and rehabilitation/ground water quality
- Well and well field design and construction
- Modeling of ground water aquifers
- Water treatment and distribution piping
- Injection well design and operation
- Water pumps and associated equipment including suction flow control devices

Applicable Experience:

Mr. Nuzman has extensive experience in the areas of ground water modeling, water well and well field design and construction, water well treatment and rehabilitation, and soil and ground water remediation. He served at technical advisor to the Attorney General of Kansas in working with the U.S.Geological Survey Analog Model laboratory in Phoenix, AZ in doing the first model work of the Equus Beds aquifer north of Wichita in 1961. He was the first to model the Ogallala aquifer in SW Kansas using the passive element, steady state, electric analog model technique in 1966.

After joining Layne Western in 1967, he has conducted numerous water well pumping tests, aquifer modeling projects and well field design and construction for multiple Cities and Companies throughout the United States and in some foreign countries. He has consulted on deep disposal wells and designed a ground water recharge facility. He has provided the foundation dewatering design for numerous construction projects. He has provided expert testimony on a variety of hydrologic issues. He has prepared specifications and bidding documents for both municipal and industrial well construction, pumps and controls for a variety of projects.

Publications:

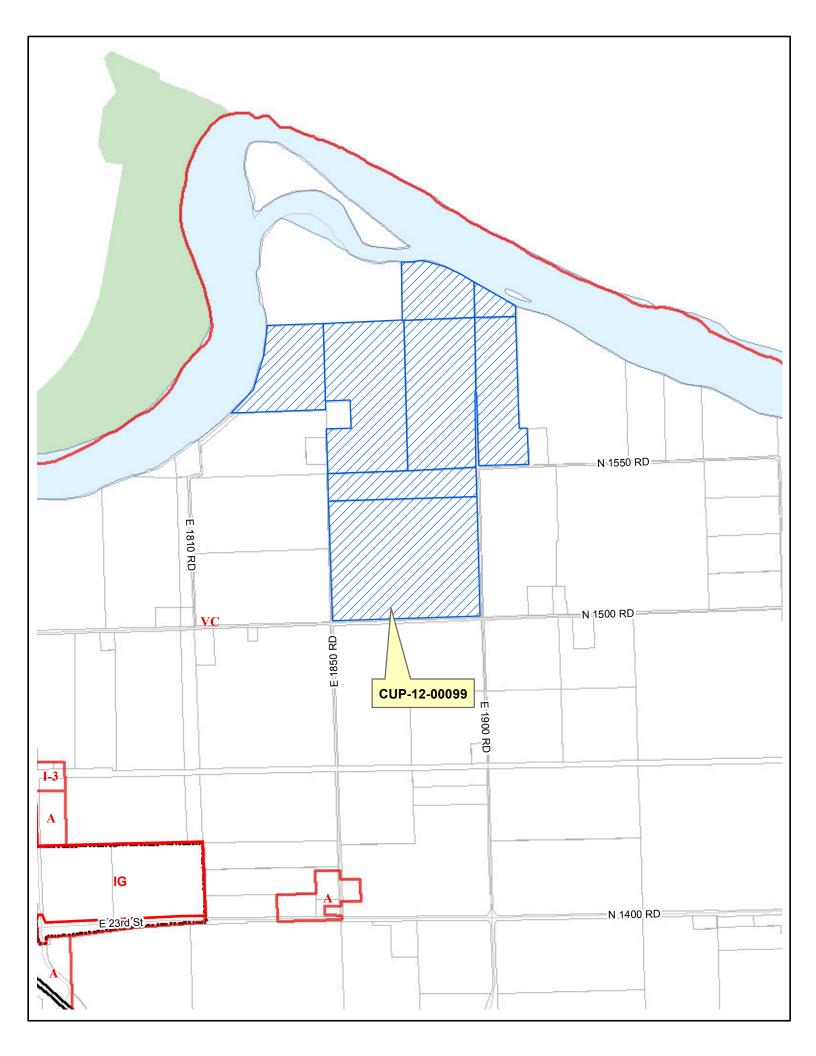
- Nuzman, Carl E. (1989) "Well Hydraulic Flow concept", Published in *Recent advances in Ground-Water Hydrology*, by the American Institute of hydrology pgs 72-77.
- Nuzman, Carl E. (1978, revised 1985) "Ground-Water and Well Efficiency" Published by Doerr metal Products, Larned, KS pgs 67.
- Winslow, John D. and C. E. Nuzman, (1966): "Electric Analog Model of the Kansas River alluvium in the vicinity of Topeka, Kansas", Kansas Geological Survey. Lawrence, KS.
- Contributor to the "Handbook of Ground-Water Development", by Roscoe Moss Company, Los Angeles, CA on Well Rehabilitation. 1990.
- Contributing author "Ground-Water Development handbook M-21" and contributed to the revised edition of Manual M-21 by the American Water Works Association, Denver, CO.
- Other technical papers and numerous client reports of study have been made.

Inventions:

- Co-inventor of a filament wound fiber glass water well screen;
- Inventor of an In-situ Ground Water Treatment System, assigned to Layne Western Company, Inc;
- Co-inventor of a patent of a non-vortexing passive pump intake strained for boiling water reactor nuclear power plants and used on other water resource applications.

Professional Societies:

- American Society of Biological and Agricultural Engineers
- American Society of Civil Engineers
- American Geophysical Union
- American Institute of Hydrology
- American Water Works Association
- National Ground Water Association
- National Society of Professional engineers
- Kansas Society of Professional Engineers



Comments on the Carl Nuzman report: "Evaluation of Penny's Concrete and Sand LLC, Proposed Sand Pit Operation on Ground Water"

By

Carl D. McElwee, Ph.D Emeritus Professor Geology Department University of Kansas Lawrence, KS

September 18, 2012

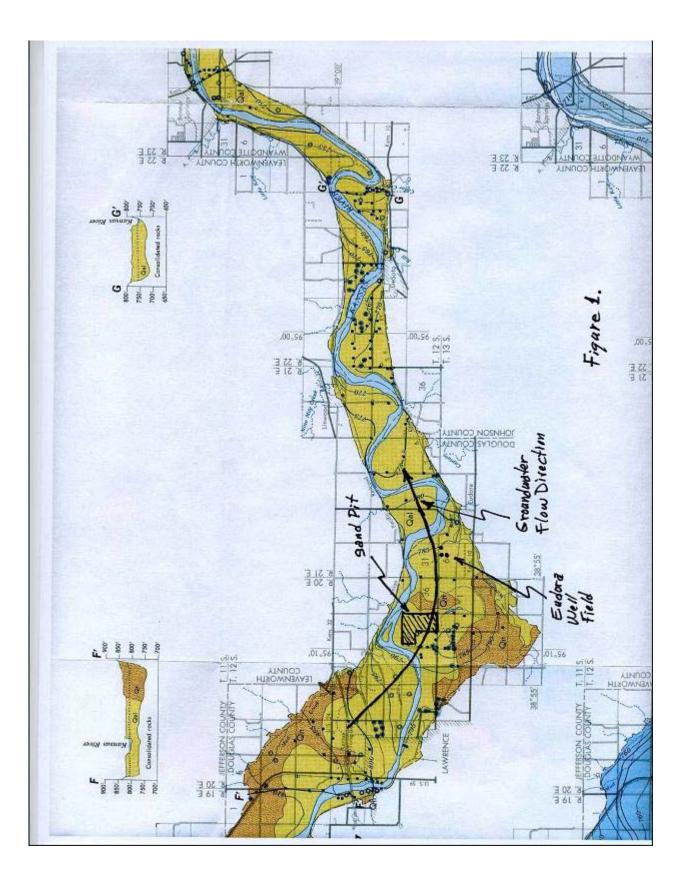
Introduction

Mr. Nuzman has brought together a considerable amount of data regarding the proposed project. He is a respected member of the scientific community studying groundwater. As is always the case, the data must be interpreted and analyzed to draw conclusions. I would like to point out some places where the data may be interpreted and analyzed in an alternate and reasonable manner to arrive at different conclusions. In addition, I would like to bring out some other points that need to be considered in evaluating the possible impact of this pit mining operation.

Groundwater Gradient direction

The gradient of groundwater is the driving force that causes it to move. Mr.Nuzman mainly uses the water level data of Kansas Geological Survey (KGS) Bulletin 130, Part 1. The generalized static water table map that he uses (Exhibit D) gives too much weight to water moving down the Wakarusa River Valley (which joins the Kansas River Valley just south of the proposed sand pit). This distorts his ground water gradient and leads to the conclusion given in Exhibit F that the capture zone for the Eudora Well Field is south of the proposed pit.

On the other hand, if one considers the newer report KGS Bulletin 206, Part 2, it shows that the Kansas River is the major force and that water moves down the valley generally from west to east more or less parallel to the valley walls. The resulting groundwater gradient and flow direction is shown in Figure 1 below. This data shows that water will move from the proposed sand pit to the Eudora Well Field. I have done calculations of capture curves (area of groundwater capture in a given time by the well) and travel times based on work that I published in *Ground Water* (McElwee, 1991, A copy of that paper has been supplied to the DG CO Planning Office). That work shows that the minimum travel time between the proposed sand pit and the Eudora Well Field could be about 5.5 years. In addition, the 6 and 8 year capture curves significantly overlie the proposed sand pit, as shown in Figure 2 below. Details of this work are given in Appendix I.



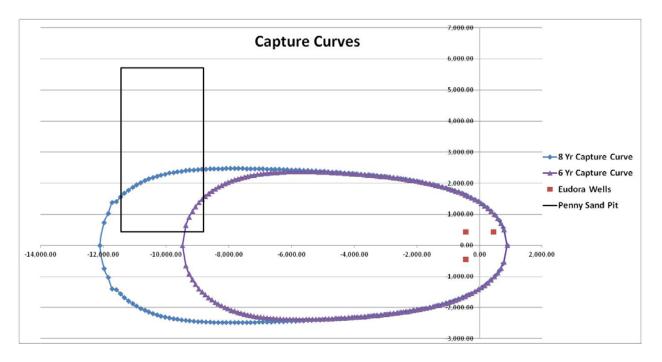


Figure 2.

Both of the KGS reports referred to are old and can't be relied on for absolute numbers. However, they do allow us to reach some general conclusions. In addition, there is a lot of variability in the aquifer (things change with space and time). So, the conclusion must be that one can't state with certainty that the proposed sand pit will have no effect on the Eudora Well Field. Of course there are many other private wells that are down-gradient from the proposed sand pit and much closer that could also be affected.

Effect of Pit on Water Levels and Quality in Aquifer

Mr. Nuzman states on page 8 that "The static water level elevation in the sand pit will be about the same as the water surface elevation in the Kansas River." That is probably true if the pit is close to the river. This means that the water level in the aquifer will be lowered around the pit, because the water levels in the aquifer are generally a little higher than the river level. This could negatively affect some nearby wells. Mr. Nuzman also states that "Sand pits beneficially support the yield of wells that are down-gradient from a pit that is within the area of influence of a well." In other words the well would be pumping water from the pit. This means

that the quality of the well water would depend on the quality of the water in the pit. In general, the quality of surface water in rivers and lakes is much poorer than the quality of groundwater. So there is the potential for pollution.

If this pit is allowed, a huge deep lake (about 70 feet deep on average) will be created. This will be a flow-through lake, which means that groundwater from upgradient will flow in one side of the lake and flow out the down-gradient side of the lake. The net result is a continual mixing of the groundwater and the surface water from the pit, which then continues to flow down the valley in the aquifer to the next user of the groundwater.

As the well drilling logs in Mr. Nuzman's reports shows, the overburden (soil, silt, and clay) that must be removed to access the sand is substantial. It is in the range of 15-23 feet in most places, in some areas less and some areas more. However, most logs in the vicinity of the proposed sand pit indicate about 23 feet of overburden to be dealt with. This is a major logistics problem that must be dealt with while keeping any surface runoff out of the pit. There is the potential for pollution from surface runoff. This overburden material has been the filter material to keep pollutants out of the deeper aquifer, removing it exposes the aquifer. The resulting piles of surficial material may contain fertilizer and pesticide residue and daughter products from their decay. Apparently, the plan is to emplace at least some of this material back into the pit. If this is done, the overburden material should be extensively tested for possible pollutants before such use.

Mr. Nuzman mentions that a few investigations have been made on the effect of sand pits on groundwater quality and that they have not shown any significant human health effect. However, one can't infer from these few studies that there will never be a problem. In fact, at least one of those studies (KGS OFR 2008-4) did come to the conclusion that there was a measurable interconnection between the sand pit waters and the local aquifer and that there was a potential for pollution. The following is a direct quote from the conclusions of that study.

[&]quot;The concentration distributions of pesticides and organics other than pesticides at the four pit sites in northwest Wichita, as well as the general pattern in iron, manganese, and ammonium ion concentrations in the downgradient well waters relative to the upgradient well and pit waters, indicate that surface water in the sand pits flows into the ground water in the southeast to south-southeast

direction of the ground-water flow at the study sites. The evidence for connection between the surface and ground waters at the two southern Wichita sites is not as strong as for the four northwest Wichita sites. However, distribution of some constituents and chemical properties do fit the general pattern of entrance of pit water into the ground water. This would be expected to occur most prominently when surface runoff into the pits increases the hydraulic gradient between the pit surface and ground-water levels. Thus, stormwater runoff containing contaminants can enter ground water through the sand pits and impact ground-water quality"

Effect of Pit on the River System

Material has previously been provided that shows the river bank in the vicinity of this proposed sand pit is unstable and has moved over time. Geologic history tells us this river will move again, we just don't know when. During a flood event the river could change course and breach the proposed sand pit. This would have a dramatic effect on the river system. Since the sand pit is deep (about 70 feet) and the river is very shallow, the pit would capture the bed load of the river and cause the river to become unstable. This would result in deepening the channel upstream (head cutting) and degradation of the channel downstream. It would take years for the river to reach a new stable equilibrium. Pits should not be allowed in areas where pit capture is a possibility.

Conclusions

I have shown that a reasonable interpretation of the available groundwater data indicates that the proposed sand pit could indeed have an effect on the Eudora Well Field and other local wells. The net effect will be a flow-through lake that mixes up-gradient aquifer water with sand pit water and sends it down-gradient into the aquifer and further down the valley. This behavior has been documented in studies of sand pits and aquifers. So, the conclusion is that any pollution must be prevented. The huge amount of overburden produced and its handling could be a source of pollution. Finally, the unstable nature of the river bank in this area makes it possible that the sand pit could capture the river during high flows and cause a channel change. If this were to happen, the river bed would be unstable for years until a new equilibrium was reached.

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Resume

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Present Address:	1564 E. 1850 Rd.
	Lawrence, Kansas 66046 USA

Education:

B.A., William Jewell College, Physics, 1965

M.A., The University of Kansas, Physics, 1967

Ph.D., The University of Kansas, Physics, 1971

Professional Experience:

Professor of Geology, The University of Kansas, Lawrence, Kansas, 1997-2009, now retired.

- Senior Scientist, Special Projects/Office of the Director, Kansas Geological Survey, The University of Kansas, Lawrence, Kansas, 1998-2002.
- Senior Scientist, Mathematical Geology Section, Kansas Geological Survey, The University of Kansas, Lawrence, Kansas, 1987-1998.
- Senior Scientist, Geophysics and Geochemistry Section, Kansas Geological Survey, The University of Kansas, Lawrence, Kansas, 1986-1987.
- Associate Scientist, Geohydrology Section and Geophysics and Geochemistry Section, Kansas Geological Survey, The University of Kansas, Lawrence, Kansas, 1974-1986.

Geophysicist, Texaco Inc., Bellaire, Texas, 1970-1974.

Honors, Memberships, and Affiliations:

NSF Undergraduate Research Grant (2 years, 1963-1965)

Graduation with Honors, William Jewell College (1965)

NSF Traineeship for Graduate Work (4 years, 1965-1969)

Mobil Oil Fellowship (1 year, 1969-1970)

Sabbatical leave awarded for groundwater research in The Netherlands (Aug.-Dec., 1984)

Sabbatical leave awarded for groundwater research in the United Kingdom (Jan.- May, 1993)

Center for Teaching Excellence Outstanding Graduate Teaching Award, Dept. of Geology, Univ. of Kansas, 2001.

Sabbatical leave awarded to start writing a book on groundwater modeling, Fall Semester 2002.

Leo M. & Robert M. Orth Water Resources Scholarship, Dept. of Geology, 2008

Present Major Scientific Interests:

Theoretical description of flow systems • Characterization of aquifer heterogeneity by field, laboratory, and modeling activities • Model studies of groundwater availability in Kansas • Sensitivity of groundwater models to variations in transmissivity and storage • Modeling of chemical quality of groundwater systems • Application of seismic techniques to groundwater exploration and evaluation

Professional Journal Articles

- McElwee, C.D., and Yukler, M.A., 1978, Sensitivity of groundwater flow models with respect to variations in transmissivity and storage: *Water Resources Research*, v. 14, no. 3, p. 451.
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- Ross, H.C. and McElwee, C.D., 2007, Multi-Level Slug Tests To Measure 3-D Hydraulic Conductivity Distributions: *Natural Resources Research*, DOI: 10.1007/s11053-007-9034-9, 13 pp.

Appendix I.

This calculations presented here is based on work I did and published back in 1991 in the *Ground Water* journal. I have supplied to the Planning Department a copy of that article for reference. This work shows that the minimum travel time from the Penny sand pit to the Eudora Well Field is about 5.5 years. This is from the closest point of the pit to the center of the well field. I have also calculated the 6 and 8 year capture curves for the Eudora Well field. The work shows that these capture curves include significant portions of the proposed pit.

The important parameters are as follows:

K - hydraulic conductivity - I used 1000ft/day. This is a measure of how fast water moves in the aquifer. The Nuzman report uses data from a well test on Eudora No. 8 and reports 8800 gpd/ft2, which is 1176 ft/day. This also agrees with data I have personally collected from the Kansas River Valley.

I - Hydraulic gradient (slope) of the ground water system - I used .0005, which is about 5ft in 2 miles. Bulletin 130, Part 1 and Bulletin 206, part 2 from the Kansas Geological Survey show head maps of the area in question that support this number.

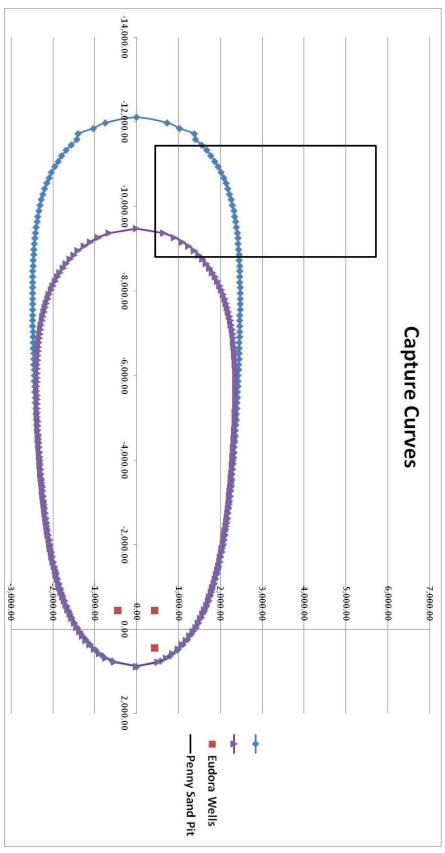
qo = -KI = -0.5 ft/day - average Darcy velocity in the aquifer - Multiplying the above two values gives this result.

B - Effective saturated thickness of aquifer - I used 30 feet. Although the aquifer has greater saturated thickness, the upper part is much finer material and has much less hydraulic conductivity. I have seen this consistently in my field work.

n - effective porosity (a measure of the pore space that water flows through) - I used 0.15 which is an average value suggested by the work of Bull 260, and also is consistent with my field work.

Q - Pump rate of the Eudora Well Field - I used 83425 ft3/day which is the approved water right of 227.77 MGY or about 433gpm.

These parameters can be used to calculate the average travel times and capture curves for parcels of water moving under the influence of the natural groundwater flow system and the influence of the pumping in the Eudora Well Field. The details of the background material to arrive at the formulas used in the following pages are given in the above referenced *Ground Water* article. The pages that follow show the capture curves for 6 and 8 years and the average minimum travel time between the sand pit and the Eudora Well Field. A capture curve outlines the area of groundwater that will flow to the pumping well in a given amount of time.



				t =	X =	B =	Q =	n =	= ob
	+				-8800	30	83425	0.15	-0.5
	2005			Time of travel	Distance	Effective	83425 Well Discharge	Effective	Average
	2005 days =			ravel	-8800 Distance traveled along X axis	30 Effective Aquifer Thickness	charge	0.15 Effective Porosity	-0.5 Average Darcy Velocity
	5.49				along X ax	nickness			ocity
	5.49 years				(is				
			t:						
			$=$ $\begin{bmatrix} n \\ 0 \end{bmatrix}$				11	× ε	qc
			$t = \left[\frac{n}{ao}\right] \left[X - \frac{Q}{2\pi aoB} \right]$			-	ſ	$X = -t + \frac{1}{2\pi n R}$	
		-	Q TaoB				uquu	TAAR	Q
			ln(1 -				/	ln(1 +	
			$+\frac{2\pi q_0}{0}$				~	$\left(1+\frac{n}{2}\right)$	$2\pi qo$
			$\frac{1}{3} ln \left(1 + \frac{2\pi q o B}{O} X \right)$				`	-X	$B \dots$

6 yr. Capture Curve Data

X(Ft)	Y(Ft)
8.8508E+02	0.0000E+00
7.8145E+02	-5.1844E+02
6.7783E+02	-7.2470E+02
5.7420E+02	-8.7735E+02
4.7057E+02	-1.0015E+03
3.6694E+02	-1.1069E+03
2.6331E+02	-1.1989E+03
1.5969E+02	-1.2804E+03
5.6059E+01	-1.3536E+03
-4.7568E+01	-1.4198E+03
-1.5120E+02	-1.4802E+03
-2.5482E+02	-1.5357E+03
-3.5845E+02	-1.5867E+03
-4.6208E+02	-1.6340E+03
-5.6571E+02	-1.6778E+03
-6.6933E+02	-1.7187E+03
-7.7296E+02	-1.7568E+03
-8.7659E+02	-1.7925E+03
-9.8022E+02	-1.8259E+03
-1.0838E+03	-1.8573E+03
-1.1875E+03	-1.8869E+03
-1.2911E+03	-1.9147E+03
-1.3947E+03	-1.9410E+03
-1.4984E+03	-1.9659E+03
-1.6020E+03	-1.9894E+03
-1.7056E+03	-2.0117E+03
-1.8092E+03	-2.0328E+03
-1.9129E+03	-2.0529E+03
-2.0165E+03	-2.0720E+03
-2.1201E+03	-2.0901E+03
-2.2238E+03	-2.1074E+03
-2.3274E+03	-2.1239E+03
-2.4310E+03	-2.1396E+03
-2.5346E+03	-2.1546E+03
-2.6383E+03	-2.1689E+03
-2.7419E+03	-2.1825E+03
-2.8455E+03	-2.1956E+03
-2.9491E+03	-2.2081E+03
-3.0528E+03	-2.2200E+03
-3.1564E+03	-2.2314E+03
-3.2600E+03	-2.2423E+03

2 2 2 2 7 5 . 0 2	2 25275.02
-3.3637E+03	-2.2527E+03
-3.4673E+03	-2.2627E+03
-3.5709E+03	-2.2722E+03
-3.6745E+03	-2.2813E+03
-3.7782E+03	-2.2899E+03
-3.8818E+03	-2.2982E+03
-3.9854E+03	-2.3060E+03
-4.0891E+03	-2.3135E+03
-4.1927E+03	-2.3206E+03
-4.2963E+03	-2.3272E+03
-4.3999E+03	-2.3335E+03
-4.5036E+03	-2.3394E+03
-4.6072E+03	-2.3449E+03
-4.7108E+03	-2.3500E+03
-4.8144E+03	-2.3547E+03
-4.9181E+03	-2.3590E+03
-5.0217E+03	-2.3628E+03
-5.1253E+03	-2.3662E+03
-5.2290E+03	-2.3691E+03
-5.3326E+03	-2.3715E+03
-5.4362E+03	-2.3733E+03
-5.5398E+03	-2.3746E+03
-5.6435E+03	-2.3753E+03
-5.7471E+03	-2.3754E+03
-5.8507E+03	-2.3747E+03
-5.9544E+03	-2.3733E+03
-6.0580E+03	-2.3712E+03
-6.1616E+03	-2.3681E+03
-6.2652E+03	-2.3642E+03
-6.3689E+03	-2.3592E+03
-6.4725E+03	-2.3531E+03
-6.5761E+03	-2.3458E+03
-6.6797E+03	-2.3372E+03
-6.7834E+03	-2.3272E+03
-6.8870E+03	-2.3156E+03
-6.9906E+03	-2.3024E+03
-7.0943E+03	-2.2873E+03
-7.1979E+03	-2.2702E+03
-7.3015E+03	-2.2510E+03
-7.4051E+03	-2.2293E+03
-7.5088E+03	-2.2051E+03
-7.6124E+03	-2.1781E+03
-7.7160E+03	-2.1480E+03

-7.8196E+03	-2.1145E+03
-7.9233E+03	-2.0773E+03
-8.0269E+03	-2.0360E+03
-8.1305E+03	-1.9903E+03
-8.2342E+03	-1.9396E+03
-8.3378E+03	-1.8833E+03
-8.4414E+03	-1.8209E+03
-8.5450E+03	-1.7515E+03
-8.6487E+03	-1.6740E+03
-8.7523E+03	-1.5871E+03
-8.8559E+03	-1.4891E+03
-8.9596E+03	-1.3913E+03
-9.0632E+03	-1.2478E+03
-9.1668E+03	-1.0945E+03
-9.2704E+03	-9.0492E+02
-9.3741E+03	-6.4783E+02
-9.4777E+03	0.0000E+00
-9.3741E+03	6.4783E+02
-9.2704E+03	9.0492E+02
-9.1668E+03	1.0945E+03
-9.0632E+03	1.2478E+03
-8.9596E+03	1.3913E+03
-8.8559E+03	1.4891E+03
-8.7523E+03	1.5871E+03
-8.6487E+03	1.6740E+03
-8.5450E+03	1.7515E+03
-8.4414E+03	1.8209E+03
-8.3378E+03	1.8833E+03
-8.2342E+03	1.9396E+03
-8.1305E+03	1.9903E+03
-8.0269E+03	2.0360E+03
-7.9233E+03	2.0773E+03
-7.8196E+03	2.1145E+03
-7.7160E+03	2.1480E+03
-7.6124E+03	2.1781E+03
-7.5088E+03	2.2051E+03
-7.4051E+03	2.2293E+03
-7.3015E+03	2.2510E+03
-7.1979E+03	2.2702E+03
-7.0943E+03	2.2873E+03
-6.9906E+03	2.3024E+03
-6.8870E+03	2.3156E+03
-6.7834E+03	2.3272E+03

-6.6797E+03	2.3372E+03
-6.5761E+03	2.3458E+03
-6.4725E+03	2.3531E+03
-6.3689E+03	2.3592E+03
-6.2652E+03	2.3642E+03
-6.1616E+03	2.3681E+03
-6.0580E+03	2.3712E+03
-5.9544E+03	2.3733E+03
-5.8507E+03	2.3747E+03
-5.7471E+03	2.3754E+03
-5.6435E+03	2.3753E+03
-5.5398E+03	2.3746E+03
-5.4362E+03	2.3733E+03
-5.3326E+03	2.3715E+03
-5.2290E+03	2.3691E+03
-5.1253E+03	2.3662E+03
-5.0217E+03	2.3628E+03
-4.9181E+03	2.3590E+03
-4.8144E+03	2.3547E+03
-4.7108E+03	2.3500E+03
-4.6072E+03	2.3449E+03
-4.5036E+03	2.3394E+03
-4.3999E+03	2.3335E+03
-4.2963E+03	2.3272E+03
-4.1927E+03	2.3206E+03
-4.0891E+03	2.3135E+03
-3.9854E+03	2.3060E+03
-3.8818E+03	2.2982E+03
-3.7782E+03	2.2899E+03
-3.6745E+03	2.2813E+03
-3.5709E+03	2.2722E+03
-3.4673E+03	2.2627E+03
-3.3637E+03	2.2527E+03
-3.2600E+03	2.2423E+03
-3.1564E+03	2.2314E+03
-3.0528E+03	2.2200E+03
-2.9491E+03	2.2081E+03
-2.8455E+03	2.1956E+03
-2.7419E+03	2.1825E+03
-2.6383E+03	2.1689E+03
-2.5346E+03	2.1546E+03
-2.4310E+03	2.1396E+03
-2.3274E+03	2.1239E+03

-2.2238E+03	2.1074E+03
-2.1201E+03	2.0901E+03
-2.0165E+03	2.0720E+03
-1.9129E+03	2.0529E+03
-1.8092E+03	2.0328E+03
-1.7056E+03	2.0117E+03
-1.6020E+03	1.9894E+03
-1.4984E+03	1.9659E+03
-1.3947E+03	1.9410E+03
-1.2911E+03	1.9147E+03
-1.1875E+03	1.8869E+03
-1.0838E+03	1.8573E+03
-9.8022E+02	1.8259E+03
-8.7659E+02	1.7925E+03
-7.7296E+02	1.7568E+03
-6.6933E+02	1.7187E+03
-5.6571E+02	1.6778E+03
-4.6208E+02	1.6340E+03
-3.5845E+02	1.5867E+03
-2.5482E+02	1.5357E+03
-1.5120E+02	1.4802E+03
-4.7568E+01	1.4198E+03
5.6059E+01	1.3536E+03
1.5969E+02	1.2804E+03
2.6331E+02	1.1989E+03
3.6694E+02	1.1069E+03
4.7057E+02	1.0015E+03
5.7420E+02	8.7735E+02
6.7783E+02	7.2470E+02
7.8145E+02	5.1844E+02
8.8508E+02	0.0000E+00

8 yr. Capture Curve Data

X(Ft)	Y(Ft)
8.8516E+02	0.0000E+00
7.5519E+02	-5.7893E+02
6.2523E+02	-8.0688E+02
4.9526E+02	-9.7403E+02
3.6530E+02	-1.1087E+03
2.3533E+02	-1.2220E+03
1.0536E+02	-1.3199E+03
-2.4604E+01	-1.4059E+03

-1.5457E+02	-1.4824E+03
-2.8454E+02	-1.5510E+03
-4.1450E+02	-1.6130E+03
-5.4447E+02	-1.6694E+03
-6.7444E+02	-1.7210E+03
-8.0440E+02	-1.7683E+03
-9.3437E+02	-1.8118E+03
-1.0643E+03	-1.8521E+03
-1.1943E+03	-1.8893E+03
-1.3243E+03	-1.9240E+03
-1.4542E+03	-1.9562E+03
-1.5842E+03	-1.9863E+03
-1.7142E+03	-2.0144E+03
-1.8441E+03	-2.0408E+03
-1.9741E+03	-2.0655E+03
-2.1041E+03	-2.0887E+03
-2.2340E+03	-2.1106E+03
-2.3640E+03	-2.1313E+03
-2.4940E+03	-2.1507E+03
-2.6239E+03	-2.1692E+03
-2.7539E+03	-2.1866E+03
-2.8839E+03	-2.2031E+03
-3.0138E+03	-2.2188E+03
-3.1438E+03	-2.2337E+03
-3.2738E+03	-2.2479E+03
-3.4037E+03	-2.2614E+03
-3.5337E+03	-2.2742E+03
-3.6637E+03	-2.2865E+03
-3.7936E+03	-2.2982E+03
-3.9236E+03	-2.3093E+03
-4.0536E+03	-2.3200E+03
-4.1835E+03	-2.3302E+03
-4.3135E+03	-2.3399E+03
-4.4435E+03	-2.3493E+03
-4.5734E+03	-2.3582E+03
-4.7034E+03	-2.3668E+03
-4.8334E+03	-2.3750E+03
-4.9633E+03	-2.3829E+03
-5.0933E+03	-2.3904E+03
-5.2233E+03	-2.3976E+03
-5.3532E+03	-2.4046E+03
-5.4832E+03	-2.4112E+03
-5.6132E+03	-2.4175E+03

-5.7431E+03	-2.4236E+03
-5.8731E+03	-2.4293E+03
-6.0031E+03	-2.4348E+03
-6.1330E+03	-2.4401E+03
-6.2630E+03	-2.4450E+03
-6.3930E+03	-2.4497E+03
-6.5229E+03	-2.4540E+03
-6.6529E+03	-2.4581E+03
-6.7829E+03	-2.4619E+03
-6.9128E+03	-2.4653E+03
-7.0428E+03	-2.4684E+03
-7.1728E+03	-2.4712E+03
-7.3027E+03	-2.4735E+03
-7.4327E+03	-2.4755E+03
-7.5627E+03	-2.4769E+03
-7.6926E+03	-2.4779E+03
-7.8226E+03	-2.4784E+03
-7.9526E+03	-2.4782E+03
-8.0825E+03	-2.4774E+03
-8.2125E+03	-2.4758E+03
-8.3425E+03	-2.4734E+03
-8.4724E+03	-2.4701E+03
-8.6024E+03	-2.4657E+03
-8.7324E+03	-2.4602E+03
-8.8623E+03	-2.4534E+03
-8.9923E+03	-2.4451E+03
-9.1223E+03	-2.4351E+03
-9.2522E+03	-2.4234E+03
-9.3822E+03	-2.4095E+03
-9.5122E+03	-2.3934E+03
-9.6421E+03	-2.3746E+03
-9.7721E+03	-2.3530E+03
-9.9021E+03	-2.3281E+03
-1.0032E+04	-2.2995E+03
-1.0162E+04	-2.2669E+03
-1.0292E+04	-2.2297E+03
-1.0422E+04	-2.1874E+03
-1.0552E+04	-2.1393E+03
-1.0682E+04	-2.0848E+03
-1.0812E+04	-2.0230E+03
-1.0942E+04	-1.9528E+03
-1.1072E+04	-1.8730E+03
-1.1202E+04	-1.7819E+03

-1.1332E+04	-1.6775E+03
-1.1462E+04	-1.5568E+03
-1.1592E+04	-1.4155E+03
-1.1722E+04	-1.3905E+03
-1.1852E+04	-1.0325E+03
-1.1982E+04	-7.4132E+02
-1.2111E+04	0.0000E+00
-1.1982E+04	7.4132E+02
-1.1852E+04	1.0325E+03
-1.1722E+04	1.3905E+03
-1.1592E+04	1.4155E+03
-1.1462E+04	1.5568E+03
-1.1332E+04	1.6775E+03
-1.1202E+04	1.7819E+03
-1.1072E+04	1.8730E+03
-1.0942E+04	1.9528E+03
-1.0812E+04	2.0230E+03
-1.0682E+04	2.0848E+03
-1.0552E+04	2.1393E+03
-1.0422E+04	2.1874E+03
-1.0292E+04	2.2297E+03
-1.0162E+04	2.2669E+03
-1.0032E+04	2.2995E+03
-9.9021E+03	2.3281E+03
-9.7721E+03	2.3530E+03
-9.6421E+03	2.3746E+03
-9.5122E+03	2.3934E+03
-9.3822E+03	2.4095E+03
-9.2522E+03	2.4234E+03
-9.1223E+03	2.4351E+03
-8.9923E+03	2.4451E+03
-8.8623E+03	2.4534E+03
-8.7324E+03	2.4602E+03
-8.6024E+03	2.4657E+03
-8.4724E+03	2.4701E+03
-8.3425E+03	2.4734E+03
-8.2125E+03	2.4758E+03
-8.0825E+03	2.4774E+03
-7.9526E+03	2.4782E+03
-7.8226E+03	2.4784E+03
-7.6926E+03	2.4779E+03
-7.5627E+03	2.4769E+03
-7.4327E+03	2.4755E+03

-7.3027E+03	2.4735E+03
-7.1728E+03	2.4712E+03
-7.0428E+03	2.4684E+03
-6.9128E+03	2.4653E+03
-6.7829E+03	2.4619E+03
-6.6529E+03	2.4581E+03
-6.5229E+03	2.4540E+03
-6.3930E+03	2.4497E+03
-6.2630E+03	2.4450E+03
-6.1330E+03	2.4401E+03
-6.0031E+03	2.4348E+03
-5.8731E+03	2.4293E+03
-5.7431E+03	2.4236E+03
-5.6132E+03	2.4175E+03
-5.4832E+03	2.4112E+03
-5.3532E+03	2.4046E+03
-5.2233E+03	2.3976E+03
-5.0933E+03	2.3904E+03
-4.9633E+03	2.3829E+03
-4.8334E+03	2.3750E+03
-4.7034E+03	2.3668E+03
-4.5734E+03	2.3582E+03
-4.4435E+03	2.3493E+03
-4.3135E+03	2.3399E+03
-4.1835E+03	2.3302E+03
-4.0536E+03	2.3200E+03
-3.9236E+03	2.3093E+03
-3.7936E+03	2.2982E+03
-3.6637E+03	2.2865E+03
-3.5337E+03	2.2742E+03
-3.4037E+03	2.2614E+03
-3.2738E+03	2.2479E+03
-3.1438E+03	2.2337E+03
-3.0138E+03	2.2188E+03
-2.8839E+03	2.2031E+03
-2.7539E+03	2.1866E+03
-2.6239E+03	2.1692E+03
-2.4940E+03	2.1507E+03
-2.3640E+03	2.1313E+03
-2.2340E+03	2.1106E+03
-2.1041E+03	2.0887E+03
-1.9741E+03	2.0655E+03
-1.8441E+03	2.0408E+03

-1.7142E+03	2.0144E+03
-1.5842E+03	1.9863E+03
-1.4542E+03	1.9562E+03
-1.3243E+03	1.9240E+03
-1.1943E+03	1.8893E+03
-1.0643E+03	1.8521E+03
-9.3437E+02	1.8118E+03
-8.0440E+02	1.7683E+03
-6.7444E+02	1.7210E+03
-5.4447E+02	1.6694E+03
-4.1450E+02	1.6130E+03
-2.8454E+02	1.5510E+03
-1.5457E+02	1.4824E+03
-2.4604E+01	1.4059E+03
1.0536E+02	1.3199E+03
2.3533E+02	1.2220E+03
3.6530E+02	1.1087E+03
4.9526E+02	9.7403E+02
6.2523E+02	8.0688E+02
7.5519E+02	5.7893E+02
8.8516E+02	0.0000E+00

Wells X (map	Wells Y (map	Wells X (ft)	Wells Y (ft)
in)	in)		
-0.25	0.25	-440	440
-0.25	-0.25	-440	-440
0.25	0.25	440	440
Pit X (map in)	Pit Y (map in)	Pit X (ft)	Pit Y (ft)
Pit X (map in) -5	Pit Y (map in) 0.25	Pit X (ft) -8800	Pit Y (ft) 440
		• •	
-5	0.25	-8800	440
-5 -6.5	0.25 0.25	-8800 -11440	440 440



Computer Notes

Capture Zones for Simple Aquifers

by Carl D. McElwee^a

Abstract. The protection and cleanup of aquifers is a matter of high priority for all states and the federal government. One concept that is receiving increased attention is that of wellhead protection. Capture zones showing the area influenced by a well within a certain time are useful for both aquifer protection and cleanup. If hydrodynamic dispersion is neglected, a deterministic curve defines the capture zone. Analytical expressions for the capture zones can be derived for simple aquifers. However, the capture zone equations are transcendental and cannot be explicitly solved for the coordinates of the capture zone boundary. Fortunately, an iterative scheme allows the solution to proceed quickly and efficiently even on a modest personal computer. Three forms of the analytical solution must be used in an iterative scheme to cover the entire region of interest, after the extreme values of the x coordinate are determined by an iterative solution. The resulting solution is a discrete one, and usually 100-1000 intervals along the x-axis are necessary for a smooth definition of the capture zone. The presented program is written in FORTRAN and has been used in a variety of computing environments. No graphics capability is included with the program; it is assumed the user has access to a commercial package. The superposition of capture zones for multiple wells is expected to be satisfactory if the spacing is not too close. Because this program deals with simple aquifers, the results rarely will be the final word in a real application. However, the program is useful as a first phase in developing wellhead protection or aquifer cleanup schemes.

Introduction

The protection and cleanup of aquifers is a matter of high priority for all states and the federal government, as evidenced by the large number of laws and regulations that have been established in recent years. One concept that is receiving increased attention is wellhead protection, where certain potentially polluting activities are banned or regulated within an area that would affect a well within a certain time period. In terms of aquifer cleanup, one would like to know what area of an aquifer will be influenced by a discharge well within a certain time period. These areas are commonly referred to in the literature as capture zones. If hydrodynamic dispersion is neglected, a deterministic curve (sharp front) can be used to define the capture zone. Because real-world aquifers are very complex, exhibiting heterogeneity, anisotropy, and other complicating factors, the calculation of realistic capture zones is difficult. Possible techniques range from simple analytical methods to complex numerical procedures.

The calculation of sharp front movement for wells in infinite aquifers dates at least to Muskat (1937). More

Discussion open until January 1, 1992.

recently, Bear and Jacobs (1965) have investigated the movement of water bodies injected into isotropic homogeneous aquifers with uniform regional flow by analytical methods. Most ground-water texts present a steady-state analytical solution for the ground-water divide in an isotropic homogeneous aquifer with one pumping well located in a uniform regional flow field (see for example Todd, 1980, pp. 121-123); this corresponds to an infinite-time capture zone. Javandel et al. (1984, pp. 175-204) present semianalytical methods for calculating pathlines and time-related capture zones for multiple wells in simple aquifers (isotropic, homogeneous, uniform thickness, uniform regional flow, and steady state). However, their computer program is rather complex. EPA (1990) has recently sponsored development of a program to calculate wellhead protection areas (WHPA); but again the program is fairly complex. Javandel and Tsang (1986) propose infinite-time capture zone curves as a tool for aquifer cleanup; again, they use analytical methods for simple aquifers. A few authors have utilized numerical methods to calculate time-related capture zones in the presence of aquifer heterogeneity. Kinzelback (1986, pp. 227-230) presents the formalism for considering a heterogeneous velocity distribution. Shafer (1987) presents the formalism and gives examples of capture zones in heterogeneous aquifers.

The purpose of the present paper is to present a program for calculating time-related capture zones in simple aquifers. The program is short and efficient and adaptable to a range of computing environments from personal computers to mainframes. Because the program assumes simple

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aquifer conditions (isotropic, homogeneous, uniform thickness, uniform regional flow, and steady state), it should be used with care in a real-world situation. However, the program should be a useful initial planning tool for aquifer protection or cleanup.

Basic Equations

The basic equations that are used to describe the capture zone curves are taken from Bear and Jacobs (1965). As mentioned in the introduction, this formulation assumes an aquifer with a constant regional hydraulic conductivity (K). A regional flow direction and magnitude (q_o) also is assumed constant and given by the Darcy equation.

$$q_o = -K \frac{\partial h}{\partial s}$$
(1)

h is the regional hydraulic head (without the pumping well), and s is the direction of the head gradient perpendicular to lines of constant head. In what follows, it will be assumed the x axis is parallel (or antiparallel) to the regional flow direction. The aquifer is assumed to be of constant thickness (B) and constant effective porosity (n). At this point, a well pumping at a rate Q is superimposed upon the regional system, and a new steady-state head configuration is established. The object is to calculate the area of the aquifer that will contribute water to the well during a specified time period; or alternatively, to calculate the area affected by injection for a given time interval, after the well is in steady state with the regional system. The curves surrounding these affected areas are loosely called capture curves for a given time period. It is convenient to define three dimensionless parameters:

$$\bar{\mathbf{x}} = \frac{2\pi q_0 \mathbf{B}}{\mathbf{Q}} \mathbf{x} \tag{2}$$

$$\overline{\mathbf{y}} = \frac{2\pi q_0 \mathbf{B}}{\mathbf{O}} \mathbf{y} \tag{3}$$

$$\overline{t} = \frac{2\pi q_o^2 B}{nQ} t \tag{4}$$

 q_o , B, Q, and n are the previously defined Darcy velocity, aquifer thickness, pumpage rate, and effective porosity, respectively. x, y, and t are the space and time coordinates in the real world; whereas \bar{x} , \bar{y} , and \bar{t} are their dimensionless counterparts. Using these dimensionless variables, Bear and Jacobs (1965) show that the capture curves are given by the following equation.

$$\exp(\overline{x} - \overline{t}) = \cos \overline{y} + \frac{\overline{x}}{\overline{y}} \sin \overline{y}$$
 (5)

Unfortunately, equation (5) is a transcendental equation which cannot be solved explicitly for either \overline{x} or \overline{y} .

There are two cases where equation (5) can be simplified somewhat. When $\overline{t} \rightarrow \infty$, equation (5) reduces to

$$\overline{\mathbf{x}} = -\frac{\overline{\mathbf{y}}}{\tan \overline{\mathbf{y}}} \tag{6}$$

which is the familiar form for the ground-water divide (Todd, 1980, pp. 121-123). From equation (6), it is seen that as $\overline{x} \to \infty$, the limiting value of \overline{y} is $\pm \pi$. The stagnation point occurs at $\overline{y} = 0$ and $\overline{x} = -1$; this result can be obtained from equation (6) by taking the limit as $\overline{y} \to 0$ (see Figure 1). Another useful simplification of equation (5) results when \overline{y} = 0; this corresponds to the two points where the capture curve crosses the \overline{x} axis. Taking the limit as $\overline{y} \to 0$ of equation (5) gives the extreme values \overline{x}_e ,

$$\exp\left(\overline{\mathbf{x}}_{e} - \overline{\mathbf{t}}\right) = 1 + \overline{\mathbf{x}}_{e} \tag{7}$$

(See Figure 1 for examples of $\bar{x}_{e.}$) A slight rearrangement of equation (7) gives the form

$$\overline{\mathbf{t}} = \overline{\mathbf{x}}_{\mathbf{e}} - \ln\left(1 + \overline{\mathbf{x}}_{\mathbf{e}}\right) \tag{8}$$

Equations (5) and (8) will form the basis for calculating capture curves at a given normalized time \overline{t} . Unfortunately, both are transcendental equations, so iterative techniques will be used to obtain their solution. The resulting curves will enclose the area of the aquifer containing water either injected or discharged by the well up to time \overline{t} . The curves represent sharp fronts (deterministic curves) because hydrodynamic dispersion has been neglected. Those who are not interested in the mathematical details of solution may wish to skip to the section describing the computer program availability.

Iterative Solution

The capture curves given by equation (5) are symmetric about the \bar{x} axis; and the x axis is assumed to be parallel to the regional hydraulic gradient with its origin at the well. The requirement that the origin be at the well is relaxed in the computer program. From the discussion in the previous section, the limits on the coordinates are $-1 \le \overline{x} \le \infty$ and $-\pi \leq \overline{y} \leq \pi$. The solution that we shall obtain is a numerical one at discrete values of \bar{x} . The approach that we shall take involves solving equation (8) for the extreme values of \bar{x} at a certain t. The region bounded by these two extremes will be discretized to give a certain number of discrete values of \overline{x} (usually between 100 and 1000). Let \bar{x}_i represent one of these values. At that point with \overline{t} and \overline{x} known, equation (5) will be solved to obtain y. Unfortunately, no single form of equation (5) seems to work well for the full range of coordinates. (Three forms will be used later.)

The extreme values of \overline{x} are found by solving equation (8). Rearranging equation (8) slightly allows an iterative solution scheme to be developed (one-point method, Atkinson, 1989, pp. 76-83).

$$\overline{\mathbf{x}}_{e}^{(m+1)} = \overline{\mathbf{t}} + \ln[1 + \overline{\mathbf{x}}_{e}^{(m)}]$$
(9)

The m in equation (9) is an iteration index. An initial guess for \bar{x}_e must be known, but $\bar{x}_e = 0$ always seems to work well. Iteration continues on equation (9) until convergence occurs. If the initial guess for \bar{x}_e is zero and \bar{t} is positive, it is clear that equation (9) will converge on a positive value. If \bar{t} is small, then \bar{x}_e also will be small and the logarithmic term of equation (8) can be written as a series expansion to yield

$$\overline{t} = \frac{\overline{x}_e^2}{2} - \frac{\overline{x}_e^3}{3} + \frac{\overline{x}_e^4}{4} - \dots$$
 (10)

Solving for the lowest power of \bar{x}_e gives

$$\bar{x}_{e}^{(m+1)} = \sqrt{2} \left[\bar{t} + \frac{\bar{x}_{e}^{(m)3}}{3} - \frac{\bar{x}_{e}^{(m)4}}{4} + \dots \right]^{\frac{1}{2}}$$
(11)

Iterating equation (11) works well for small values of \overline{t} and \overline{x}_e .

Equations (9) and (11) work well for the positive value of the \overline{x} extremes; however, a slightly different version is needed to find the negative extreme value. Rearranging equation (7) slightly gives the following iterative solution.

$$\overline{\mathbf{x}}_{e}^{(m+1)} = \exp\left(\overline{\mathbf{x}}_{e}^{(m)} - \overline{\mathbf{t}}\right) - 1 \tag{12}$$

Clearly, if $\overline{t} \to \infty$, equation (12) gives an extreme value of -1. If the initial guess for \overline{x}_e is zero and \overline{t} is positive, the result for the first iteration will be negative. Experience has shown that equation (12) converges rapidly on the negative value of \overline{x}_e .

Now that the extreme values of \overline{x} are known for a particular \overline{t} , we can pick a discrete value \overline{x}_i located between these two extremes. The only unknown in equation (5) is now \overline{y} , and an iterative solution can be set up. The most obvious iterative form is obtained from equation (5) by multiplying by \overline{y} and $\exp(\overline{t} - \overline{x})$ to obtain

$$\overline{y}_{i}^{(m+1)} = \exp(\overline{t} - \overline{x}_{i}) \cdot [\overline{y}_{i}^{(m)} \cos \overline{y}_{i}^{(m)} + \overline{x}_{i} \sin \overline{y}_{i}^{(m)}]$$
....(13a)

However, numerical experiments show that equation (13a) does not have as wide a region of convergence as we would like. The convergence properties of equation (13a) can be changed by adding \overline{y}_i to each side of the equation (Atkinson, 1989, pp. 76-83). The resulting equation which we shall use is

$$\overline{y}_{i}^{(m+1)} = \frac{\overline{y}_{i}^{(m)}}{2} + \frac{1}{2} \exp(\overline{t} - \overline{x}_{i}) \cdot [\overline{y}_{i}^{(m)} \cos \overline{y}_{i}^{(m)} + \overline{x}_{i} \sin \overline{y}_{i}^{(m)}]$$
(13b)

As long as $|\bar{y}_i| \le \pi/2$ and $\bar{x} \ge 1$, equation (13b) works well.

An alternate form of equation (5) can be obtained by solving for $\cos \overline{y}$ and then taking the inverse cosine function.

$$\overline{y}_{i}^{(m+1)} = \cos^{-1} \left[\exp\left(\overline{x}_{i} - \overline{t}\right) - \frac{\overline{x}_{i}}{\overline{y}_{i}^{(m)}} \sin \overline{y}_{i}^{(m)} \right]$$
(14)

Numerical experiments show that this form works well for all values of \overline{x} and \overline{y} as long as $\overline{t} \le 1$. For $\overline{t} \ge 1$, equation (14) can be used only for $\overline{x} \le 1$.

The final form of equation (5) needed to fill in all remaining values of \overline{x} , \overline{y} , and \overline{t} is given by rearranging and solving for the tangent of \overline{y}_i .

$$\tan \overline{y}_{i} = \left(\frac{\overline{y}_{i}}{\overline{x}_{i}} \right) \cdot \left(\frac{\exp(\overline{x}_{i} - \overline{t})}{\cos \overline{y}_{i}} - 1 \right)$$
(15)

Using the trigonometric identity $\tan(-\theta) = \tan(\pi - \theta)$ allows us to rewrite equation (15) in iterative notation.

$$\overline{y}_{i}^{(m+1)} = \pi - \tan^{-1} \left[\left(\frac{\overline{y}_{i}^{(m)}}{\overline{x}_{i}} \right) \cdot \left(1 - \frac{\exp(\overline{x}_{i} - \overline{t})}{\cos \overline{y}_{i}^{(m)}} \right) \right] \dots (16)$$

Numerical experiments show that this equation works well for $\overline{t} > 1$ and $\overline{x} > 1$ if $|\overline{y}_i| > \pi/2$. Clearly, equation (16) has a problem at $\overline{y} = \pi/2$ because the cosine function is zero. Therefore, special provision must be made to prevent equation (16) from being used too near the region where $\overline{y} = \pi/2$.

The iterative equations (13), (14), and (16) for \overline{y} require an initial guess for the m = 0 iteration. That question was avoided in the above paragraphs where the equations were developed. However, in practice, this presents no problem. Using the extreme values of \overline{x} , a discrete set of \overline{x}_i 's are calculated by dividing the region between the extremes into an integral number of steps (usually between 100 and 1000). Solution then proceeds sequentially from the negative \bar{x} extreme to the positive \bar{x} extreme. At each of the extreme values of \overline{x} , we know that $\overline{y} = 0$. Therefore, as we step through the solution we will always know the value of \overline{y} at the previous \overline{x} value, and we can use this as the initial guess for \overline{y} at the current value of \overline{x} . If at least 100 steps in \overline{x} are used, the value of y does not change dramatically in one step and the above procedure is very efficient. As the solution proceeds, the appropriate equation (13), (14), or (16) is selected depending on the values of \overline{t} , \overline{x} , and the current value of y.

Computer Program

A simple computer program to calculate capture curves based on the material presented here has been written in FORTRAN and is available at nominal cost from the Publication Sales Office of the Kansas Geological Survey. Computer Program Series #90-5 is a publication containing the material of this paper as well as a more detailed description of the program workings, a FORTRAN listing, some sample data sets with output, and an IBM compatible disk containing the program. We commonly run the program on an IBM AT compatible computer; however, it can be adapted easily to a wide variety of computer environments. Usually only the input and output statements need modification.

Results and Application

The results of using the algorithms discussed here are shown in Figure 1 for \overline{t} values of 1, 3, 5, and ∞ . The $\overline{t} = \infty$ curve corresponds to the normal ground-water divide. Equations (13), (14), and (16) can be applied only in certain regions of \overline{t} , \overline{x} , and \overline{y} as discussed earlier. These various regions are shown on Figure 1, each with a different background pattern. Figure 1 was produced with a commercially available graphics package directly from the output file of the program. No graphics capability is included in the program; it is assumed that the user has access to a similar package.

In a real-world application, one will not be dealing with the dimensionless quantities \overline{t} , \overline{x} , and \overline{y} but with actual time

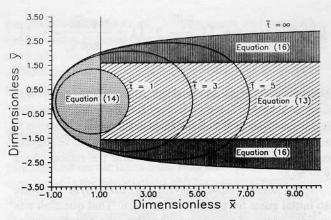


Fig. 1. Capture zones and regions of equation application.

and distances. However, equations (2), (3), and (4) provide the necessary conversions, so the simple user interface in the main program provides the connection to a specific application. Parameters may be given in any consistent set of units. To begin, one must know the average value of hydraulic conductivity and the regional hydraulic gradient vector (direction and magnitude). These quantities are used in equation (1) to calculate the specific discharge or Darcy velocity (qo). Knowing the average regional thickness of the aquifer (B), the effective porosity (n), and the discharge (or injection) rate of the well (Q), the program can calculate \overline{t} from equation (4) for the actual time of interest. The program then calculates the \overline{x}_i and \overline{y}_i of the capture curve of interest. These values of \overline{x} and \overline{y} are used with equations (2) and (3) to solve for the real-world coordinates x and y, which can then be plotted on an appropriate map base. Currently, the program assumes that the x axis is parallel to the regional hydraulic gradient; but, the well may be located at arbitrary coordinates. If the x axis assumption is not true, an appropriate rotation of coordinates will be needed before plotting on the desired map base.

Discussion

Strictly speaking, the program presented here only deals with one well in a uniform, homogeneous, isotropic aquifer with uniform, steady, regional flow. In practice these conditions are rarely satisfied. However, the type of analysis presented here can be very useful as a first phase in developing wellhead protection or aquifer cleanup schemes (Javandel and Tsang, 1986). If conservative aquifer parameters are used, the analysis presented here should outline a maximum capture zone. The program presented here only deals with one well; however, the approximate result for several wells can be obtained by applying the program once for each well and superimposing the results. As long as the capture zones do not overlap, the approximate result should be very good. As the well spacing gets smaller and the capture zones overlap, the approximate results will deviate more from the correct solution; as long as the well spacing is greater than or equal to $Q/\pi q_0 B$, the results are expected to be acceptable (see Javandel and Tsang for details of superimposing multiple wells). For the final analysis, if heterogeneity and nonuniform flow are very important, a more

complex program such as that presented by Shafer (1987) should be used.

The program presented here is useful for planning wellhead protection and aquifer cleanup schemes. However, the user must always be mindful of its limitations. The presented program is simple and can be embedded in many computing environments, including personal computers, work stations, and mainframes. We have used the program on a work station interfaced with a geographical information system (GIS) to plot capture zones for several wells in Kansas (Woods et al., 1987; Whittemore et al., 1987; and Merchant et al., 1988). The program is presented here in the hope that it will be useful to others.

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* *

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Sept. 9, 2012

Lawrence Douglas County Metropolitan Planning Office 6 East 6th Street, P.O. Box 708, Lawrence, KS 66044

Planning Staff:

As interested property owners, we are writing this letter to object to the Conditional Use Permit (CUP) that Penny Sand Co. has applied for near 1500N and 1850E. This CUP asks permission for a pit mining operation for sand removal. This would completely change the agricultural setting of the area. If allowed, this CUP would subject the area to dramatically increased industrial activity, including noise, dust, and environment destruction. We ask that you deny the CUP for the following reasons:

(1)The affected area has some interesting Douglas County history associated with it and contains some historic houses.

(2) The river bank in the vicinity of this proposed pit mining operation is unstable and has moved considerably over recent times. If pit mining is allowed in this area, in times of flood the chances of a dramatic river channel change is magnified greatly.

(3) On this proposed 434 acre pit mining site, the majority of the area is covered by some of the highest quality soils as defined by the US Department of Agriculture. It seems very short sighted to produce sand for short term gain and lose the potential for significant food and fiber production indefinitely.

(4)There is a large amount of overburden (unusable soil, silt and clay) that must be removed (typically 23-24 feet). Removing this much overburden will create an environmental nightmare

(5) Opening this pit operation will expose one of the most prolific aquifers in this region to potential pollution. This aquifer is a magnificent resource that must be protected and preserved for the future.

(6)Several neighboring house wells could be affected by this pit. Just down the valley about 1 5/8 miles lies the Eudora Public Water Supply Well Field; it could also be affected by the proposed pit mining operation.

Thank you for your consideration of our concerns.

Name	Address	Phone Number	email	
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Building Blocks Daycare Center 1411 E 1850 Road Lawrence, KS 66046 (785) 865-3999

To: *Lawrence Douglas County Metropolitan Planning Office* 6 East 6th Street, P.O. Box 708, Lawrence, KS 66044

We want to object to the greatly increased heavy truck traffic on 442 due to this application, which will interfere with our customers dripping off and picking up children. We are a licensed daycare center near the proposed Penny Sand Plant. We are licensed for 129 children that can attend our center. We have over 30 teachers that work at the center. Parents and teachers drive daily between 7 AM to 6 PM Monday through Friday. Few years back we requested the Burlington Rail Road and the State of Kansas to review the increased traffic going through 1850 Road. Within a few months of the study both the State and Burlington implemented a railroad crossing due to the increased traffic.

Please realize that we already have the following people using 442 (Old K 10).

- Up to 129 parents dropping children during the day.
- Over 30 teachers coming to our facility during the day.
- Public school buses coming to our facility to drop children at the center.
- Our current vans driving during the day to pick and bring back children from different schools in Lawrence and Eudora.
- Folks visiting Pendleton during the year to purchase vegetables and fruits.
- Folks that work in Eudora and travel to Lawrence for employment.
- Folks that live in KC and work in Lawrence use the back road (442) to get to work.

Currently everyone in the neighborhood have a well for water source to either their house or business. We can't afford to lose our only source of water. I just can't imagine digging that many acres won't affect our only water source to the facility. Without water we would lose our children and would be forced to close the facility as water is a requirement by KDHE and would eliminate over 30 jobs.

We request that you deny the permit for the safety of the children, teachers and everyone traveling on the highway.

Sincerely, Len mada

Peter Shenouda

MEMORANDUM

TO:	City of Eudora Planning Co	mmission
CC:	City of Eudora Staff	
FROM:	Scott Michie, City of Eudor	a Planning Advisory Consultant
SUBJECT:	Staff Findings, Penny San	d Conditional Use Permit to Douglas County
DATE:	September 10, 2012	County Agenda of 9-24-2012, Sand Pit CUP

The City of Eudora plans and code requirements are met in the subject sand pit application. These staff findings are submitted based on the three City zoning standards considered for a permit application most similar to the county's CUP:

Eudora Standard 1: Whether the proposed use meets City regulations.

Staff Finding: The subject application does not conflict with City of Eudora regulations, because the sand dredging site is at or beyond the outer northwest edge of the City's Planning Area; and as such, does not impede the City's long-standing public policies for: a) utilization and conservation of the natural resources northwest of the City, b) protection of its planned long term industrial areas, and c) minimization of industrial traffic through town on Main Street heading south to K-10 Highway.

Eudora Standard 2: Whether the proposed use complies with the Comprehensive Plan. Staff Finding: The application does not conflict with the City of Eudora Comprehensive Plan. The City plan calls for preservation of the river floodplain natural resources in its planning area, recognizing them as "the most prominent natural features north and west of the City." As the current processing plant is outside of the City's planning area, and the expanded sand dredging would be partially beyond the City's planning area, the operation may be considered outside of the area of City concern for "preservation of the river floodplains in its planning area." In addition, the Penny Sand application complies with the industrial land use recommendation of the City Map by directing industrial traffic west of the City:

Industrial areas should have reasonable and convenient access to major arterials and railroad facilities as required. The use of local streets and traffic that cuts through the community off of arterial streets is strongly discouraged as it increases road maintenance and traffic conflicts.

Eudora Standard 3: Whether the proposed use and site plan will be objectionable or detrimental to the public welfare of the community under the circumstances of the particular case regarding setback, height, density and similar aspects.

Staff Finding: No such objection or detriment is found in this case.

Review and analysis by Terrane Resources Company should be considered before the public can be assured against harm as to long-term potential impacts of the proposed sand pit operation on City of Eudora public water wells.

End of Memorandum



September 21, 2012

Douglas County Commission 1100 Massachusetts Street Lawrence, KS 66044-3040

RE: CUP for proposed Penny's Concrete Inc. Pit Mine

Friends of the Kaw, Inc. is a 501 c 3, grassroots environmental organization whose mission is to protect and preserve the Kansas River for present and future generations. Towards that end, we have advocated - since our inception in the early 1990's - that inriver sand and gravel operations move out of the river and onto the land (pit mining) due to (a) irreparable harm done to the river's channel, banks and ecosystem; and (b) degradation of our drinking water quality; (c) degradation to public water intake supply systems; and bridge structures.

The Kansas River has been commercially mined (dredged) for sand and gravel since the early 1900's. Past dredging activities are documented to have caused significant damage to riverbed, habitat, and water quality.

The Army Corps is currently considering a proposal from five private dredging companies to increase dredging on the Kaw close to 50%, from 2.2 million tons to 3.2 million tons of sand per year.

The following preliminary findings come from a study funded by the Kansas Department of Wildlife and Parks (KDWP) and carried out by Kansas State University researchers Melinda Daniels and Craig Paukert. The scientists have documented riverbed incision in dredged reaches, which is most likely also causing excessive bank erosion both upstream and downstream of dredge sites.

Private in-channel dredging operations on rivers like the Kansas River cause deepening and widening of the channel and accelerate erosion of the banks. As a result, dredging lowers the water level of the river and the adjacent water table in the floodplain. This creates the risk for harm to public river uses (such as water treatment facilities, municipal wells, bridge footings, etc.) as well as to fish communities throughout the watershed, including endangered species.

KANSAS RIVERKEEPER®



Kansas Riverkeeper@ Laura Calwell

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Friends of the Kaw P.O. Box 1612, Lawrence, KS 66044 Kansas City: 913-963-3460, Lawrence: 785-312-7200

Report River Pollution: 1-866-RIV-KEEP

Email: Riverkeeper#Kansas Riverang

Website: http://KansasKiver.org Friends of the Kaw recently interviewed Daniels for its public comment to the U.S. Army Corps of Engineers. "If you take 3.2 million tons from the river bottom, then the river will take 3.2 million tons from the riverbanks, trying to balance the sediment load in the system," Daniels said. "That's the simple physics of how water works in river channels to transport sediment. Landowners along the river, particularly farmers with unforested river banks next to their fields should be worried. So should anyone with a water intake pipe or a creek in their backyard. The effects of in-channel dredging will propagate both upstream and downstream from the dredge site until a hard control point, like a darn or a bedrock outcrop, is reached. That means up tributary streams as well as the main river."

Daniels surveyed major dredge holes on the Kansas River with a sophisticated new measuring technology, an acoustic Doppler instrument that mapped river channel topography and measured water velocity. The researchers discovered that while the Kansas River averages four to five feet deep, active dredge holes can measure up to forty feet deep.

The researchers also discovered that these deep dredge holes can migrate up and down river sometimes very rapidly, depending on water conditions. Even during small flow increases, researchers documented the upslope lip of a dredge hole traveling upstream.

"People used to think the dredge holes just filled up, but now we know they don't. The holes first cause erosion upstream and downstream and then eventually do fill in, but not before causing a net loss of sediment from the bed and banks of the channel, meaning the channel does not simply go back to its original state," Daniels said. "If there's no bedrock, or physical structure like the Bowersock Dam to stop them, those dredge holes cause channel erosion that will keep on going through the entire river network. Their effects can even travel up the tributaries." Unless a bridge footing or other engineering infrastructure in the river is armored, the migrating hole could erode that physical structure as well.

The technical term for this river phenomenon is a "migrating head cut." Here's how it works: The Kansas River is a sand bed river. Sand is a light sediment, and water transports it easily. When dredgers excavate into the riverbed, that hole creates a steep wall (or head cut) where the river depth suddenly increases. Water rushes rapidly over that wall, gaining speed and picking up sand from the upstream edge. At the same time, some sand falls into the hole. The water passing over the hole then picks up new sediment downstream, causing erosion there as well. The hole starts to expand, both upstream and downstream.

Over time, repeated dredging deepens and widens the river by removing sediment from the system. The result is that the river bottom lowers, along with the water level. This can leave the intakes for water treatment plants stranded. Dredging on the Missouri River has been scaled back recently because of similar problems propagating into the lower Kansas River and other tributaries to the Missouri.

When the river deepens, the water table in the floodplain lowers. Daniels said that this creates the potential for less water storage, which could affect the many municipal wells along the river. A lower water table also affects river vegetation and forests. For example, the cottonwood – the state tree of Kansas – can't survive unless its roots can reach a good water supply.

The deep dredge holes may affect fish populations, too. "The river's physical babitat is significantly different between dredged and un-dredged areas," noted Daniels.

However, dredging's most major environmental impacts for fish are not limited to the Kaw. Since migrating head cuts can also affect river tributaries, Daniels said the K-State study raises questions about risks to the habitat of endangered species (like the Topeka Shiner) that live in these smaller streams.

Daniels said that knowledge of the environmental impacts of dredging is incomplete without studying dredging's impacts on the entire Kansas River system.

"We need a new environmental impact study that considers the impacts of dredging on fish that live in the tribularies as well," said Daniels. Right now, the U.S. Army Corps of Engineers is depending on an environmental impact statement (EIS) dating from 1991.

Before Daniels and Paukert carried out their study, the effect of sand and gravel dredging on the Kansas River had not been seriously studied. This study was the first time such sophisticated measuring technology has been used.

"The Army Corps has studied similar conditions with sand dredging on the Missouri River," said Daniels. "They are aware of the problems, and if dredging is a problem for the Missouri River, then it's going to be a problem for the Kansas River. Simply shifting the problem from the Missouri to the Kansas is not a good strategy."

How fast will the dredge holes move? Water movement on the Kaw is greatly influenced by how much water the Army Corps releases from upstream reservoirs. Extreme rains plus reservoir releases can add a lot of extra velocity to the Kansas River system. In some circumstances, this may mean the dredge holes have the potential for very rapid movement.

Friends of the Kaw understands that sand is needed for a healthy construction economy and we believe enough geological studies provide evidence that sand can be reasonably and efficiently obtained from "off-river" pit mines in the Kansas River valley. Friends of the Kaw has reviewed the plans drafted by Land Plan Engineering for Penny's Concrete, Inc. proposed pit mine. We support this application for a pit mine by Penny's Concrete, Inc. However, we encourage the Douglas County Commission and Planning Commission to carefully consider and address the residential neighbors' concerns.

Sincerely,

Muchall

Laura Calwell, Kansas Riverkeeper for Friends of the Kaw

Cc: Phil Struble, Land Plan Engineering



LEAGUE OF WOMEN VOTERS® OF LAWRENCE/DOUGLAS COUNTY

SEP 24 2012

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Lawrence, Kansas

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Lawrence-Douglas County Planning Commission Eudora Planning Commission City Hall

Lawrence, Kansas 66044

RE: ITEM NO. 1: CONDITIONAL USE PERMIT FOR PENNY SAND PIT; N 1500 RD & E 1850 RD (MKM)

Dear Chairman Liese and Planning Commissioners:

The League of Women Voters of Lawrence/Douglas County bases its letters and communications on its adopted Environmental Positions. Based on excerpts from these Positions which read, to "...preserve the social and physical environment...avoid pollution of air, water, and land...[support] the conservation of agricultural land...at the county level...," we are asking that you carefully consider the environmental impact of the Penny Sand Pit excavation operation.

We recognize that the utilization of our natural resources is a necessary feature of human activities, but that we must also do it wisely and with careful consideration for preserving a sustainable environment. Therefore, based on the material available in the Staff Report, we cannot support the pit mining for sand proposed in the current request for **CUP-12-00099** and urge that the Planning Commissions deny the application.

Our reasons are as follows:

1. Contamination of the Eudora water supply is a distinct possibility based on the professional research of Professor Carl McElwee, a recognized authority on groundwater and water resources.

2. Contamination of nearby wells of neighboring properties would likely occur.

3. Chances for the permanent reorientation of the Kansas River course would be increased, especially in a flood, an environmental misfortune that many in Douglas County have attempted to avoid using containment measures.

4. Loss of irreplaceable Capability Class I and II agricultural soils would occur. This loss would be permanent, whereas the gain from the sand production would be relatively short-lived.

5. The effects of the mining operation would be counter to several statements and policies that *Horizon 2020* encourages us to follow.

6. Reclaiming the land and providing a safe and stable environment during the 30-year initial approval period of the CUP will be very expensive for the operator of the project. Maintaining the lake will also be someone's financial responsibility. There is no requirement for providing a bond or other financial guarantee to the County in the event that the owner of the project goes bankrupt or otherwise fails.

7. Because of the number of conditions required to be met, it can be predicted that these conditions will be costly to monitor and difficult to properly enforce. This will make it less of a positive revenue gain for the County.

For these reasons and others not mentioned here, we urge the Planning Commissions to recommend denial of this open pit mining **CUP-12-00099**. We appreciate the careful consideration that the Planning Commissions give to issues such as this. Thank you.

Best regards,

Melinda Henderson, President LWV Lawrence/Douglas County

Man Black

Alan Black, Chair Land Use Committee

PLANNING COMMISSION REPORT Regular Agenda – Public Hearing Item

PC Staff Report 9/24/12 ITEM NO. 2: A TO R-T; 31 ACRES; 1674 N 1000 RD (MKM) Z-12-00098: Consider a request to rezone approximately 31 acres from County A (Agriculture) to County R-T (Rural-Tourism Business), located at 1674 N 1000 Rd. Submitted by

(Agriculture) to County R-T (Rural-Tourism Business), located at 1674 N 1000 Rd. Submitted by Mid-American Association for Autistic Training and Research (MAATR), for Marcus and Sandra Patton, property owners of record. MKM

STAFF RECOMMENDATION: Staff recommends approval of the rezoning request for approximately 31 acres from A (Agricultural) District to R-T (Rural Tourism), and forwarding it to the Board of County Commissioners with a recommendation for approval based on the findings of fact found in the body of the staff report.

Staff recommends approval of the buffer width reduction to 100 ft along the north and south property line subject to the following conditions:

- The reduction on the south property line would apply only to the area needed to accommodate the activity area parking area and drive. The buffer on the remainder of the south property line would remain at 200 ft.
- A note would be added to the site plan which limits the use of the driveway to the cabins to 4 cabins, to insure it remains a low-intensity use.

Applicant's reason for request:

"The subject property is in an ideal location to meet the growing demand for service for those with autism via proven successful horse and animal therapy, along with other therapeutic and educational services. Its proximity to Lawrence and the KC metro, yet the country feel, makes it appealing for the applicant and future guests. In addition, the current improvements and uses will tie in to the applicant's overall plans, minimizing the need for construction and alterations to the subject property.

MAATR's proposed plan includes classes (such as art, music and other educational services) and respite cabins for guests to stay in. We may also have a small country store to sell items grown/made by our autistic guests. The current zoning (agricultural) does not allow these as permitted uses. Rezoning to Rural Tourism, would allow all aspects of our plan to be considered permitted uses. It will also have very little impact/change in traffic and remain low use/low intensity—those with autism do better in smaller groups, so we plan on having very personal, low-key activities."

ATTACHMENTS

Attachment A: Concept Plan Attachment B: Letter regarding buffer area on north

OTHER ACTION REQUIRED

- Approval of rezoning by Board of County Commissioners and publication of resolution.
- Property must be platted prior to development. This includes the submittal of preliminary plat for Planning Commission approval and submittal of final plat for Planning Director's administrative approval and County Commission acceptance of any

dedications. The subject property is part of a larger tract with a residence. The residence and surrounding property will be removed through the Homestead Exemption Survey prior to platting of the subject property.

- Submittal of site plan for County Commission approval.
- Building permit must be obtained from the Zoning and Codes Office prior to construction.

PUBLIC COMMENT

• No public comment was received prior to the printing of this staff report.

GENERAL INFORMATION

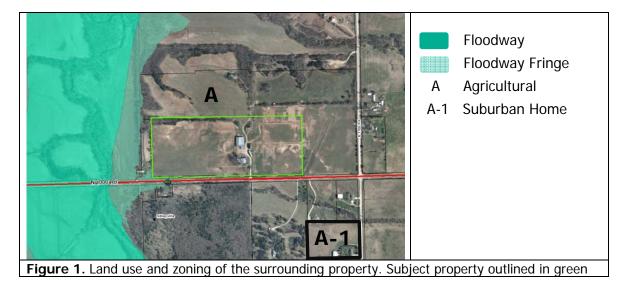
Current Zoning and Land Use: A (Agricultural) District; horse barn, mobile homes for farm employees, and various out-buildings Agricultural uses.

Surrounding Zoning and Land Use:

To the North, East and South: A (Agricultural) District,; agricultural and rural residential uses, and open space.

To the west: A (Agricultural), F-F (Floodway Fringe Overlay) and F-W (Floodway Overlay) Districts; Agricultural uses and wooded stream corridor.

(Figure 1)



Project Summary

Rezoning to the R-T District is requested for approximately 31 acres to facilitate the development of a facility that would provide therapy and educational services for children and adults with autism. The use would include a commercial riding stable, riding arena, walking trails, cabins, dwelling for on-site manager, open space, and an activity building for music, art, and other classes and activities.

The site currently contains a riding stable and arena, along with other agricultural out-buildings and mobile homes for the farm employees. The plan is to utilize the barn and riding stable as well as the other out-buildings and to maintain one mobile home for the caretaker's residence until they are able to construct a dwelling. The BZA has the authority to approve a temporary and conditional permit for a mobile home (Section 12-323-3.11 of the Zoning Regulations) so

this portion of the request will require BZA approval. The temporary and conditional permit would be required with the site planning of the property.

The applicant explained that the use is by nature low-intensity as people with autism do not do well in loud or crowded situations. They plan to construct several small cabins (3 on the west side of the property and one to the north.) Other cabins could be added during the site planning stage, as the plan provided with the rezoning is a concept plan; however it is unlikely that any additional cabins could be installed along the west side of the property as each cabin is required to have 3 acres available for a septic system. The total number of cabins will be determined at the site planning stage. Any additional cabins will require submittal of a revised site plan for consideration and action by the County Commission.

They may have a petting area in one of the out-buildings for small animal therapy and plan on constructing an activity center for music, art, and other therapy and educational programs. The size of the activity center has not been determined at this time, but the applicant estimates it will be about 2000 to 4000 sq ft. Eventually they will develop a gathering place in the activity center for their guests and their families. The proposed development is illustrated in the concept plan included as Attachment A.

As for the intensity of the use, the applicant provided the following information:

"When you are dealing with children and adults with autism, you have to keep it very simple and small. They typically do not do well in large groups. A good majority of our therapies will be one-on-one. If we do groups, it is best to keep them at 5 or less. With that being said, besides occasional 'special events', we do not perceive having more than 10 to 15 guests at a time (that is after we are operating long enough to run multiple groups at once.)

The uses that are being proposed are permitted in the A District with approval of a Conditional Use Permit; however the applicant elected to seek rezoning to the RT District in order to obtain a more permanent approval.

The applicant provided the following information regarding the proposed use:

"It will be a place of relaxation, learning and respite for children and adults with autism. Our main focus will be horse therapy. That will involve guided horseback riding in the indoor arena and outside areas alike. We will also have small animal therapy and maybe some education on growing and caring for plants.

We will eventually have small classes (such as art & music therapy), upon approval of the Rural Tourism classification. Once we are operational for awhile, we will plan a Phase II, which would include an activity and gathering place for our guests and their families. It would include a small residential kitchen for preparing small group meals.

We will also need an "on-site" manager to watch over and care for the facility. For now, we would like to keep the allowed mobile home for that person—until we can build them a permanent residence. That residence will have a kitchen and regular "home" basics. The guest cabins, however, will not have any kitchens in them." The applicant is requesting a reduced buffer area surrounding the activity area, which will be discussed later in this report.

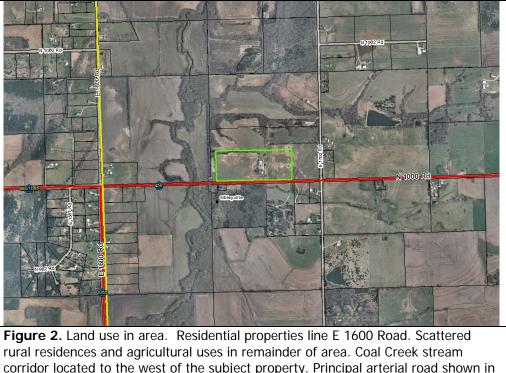
I. ZONING AND LAND USES OF SURROUNDING PROPERTIES

The surrounding area is zoned A (Agricultural) with Floodway and Floodway Fringe Overlay Zoning located along the Coal Creek stream corridor to the west and northwest of the subject property. Land uses of surrounding property include agriculture, open space, and rural residences.

Staff Finding –The surrounding properties are zoned for and primarily used for agricultural uses. Rural residences and woodlands are also present. The R-T Zoning and rural tourism use would be compatible with the zoning and land uses of surrounding property.

II. CHARACTER OF THE AREA

The subject property is located within the southern portion of the Lawrence Urban Growth Area. The area is rural in nature with a mix of agricultural and residential uses. In addition to scattered rural residences, there are 2 platted residential subdivisions about $\frac{1}{2}$ mile to the west of the subject property along E 1600 Road: Mears Addition with 5 undeveloped lots, and Cedarwood Hills Subdivision with 31 developed lots. Additional smaller land divisions were created through the 5 acre exemption for additional rural residences in this area. (Figure 2)



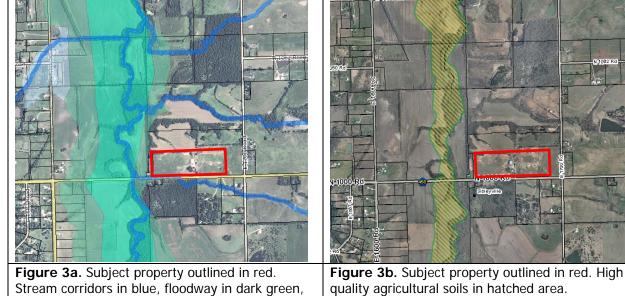
red, minor collector road shown in yellow.

The area contains environmentally sensitive lands in the form of stream corridors, regulatory floodway and floodway fringe, and woodlands; however, these are not located on the subject property. (Figure 3)

Two principal arterials, N 1000 Road/County Route 458 and E 1600 Road/County Route 1055,

intersect in the area. The subject property has good access to the major transportation network, being located on and taking direct access to N 1000 Road/County Route 458. (Figure 4)

Staff Finding – This is a rural area with a mix of agricultural and residential uses and has good access to the major transportation network. The area contains the following environmentally sensitive lands: stream corridors, regulatory floodway and floodway fringe, and stands of mature trees. The R-T Zoning is compatible with the character of the area and should serve to maintain and enhance it.



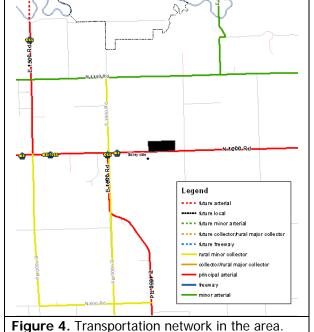
Stream corridors in blue, floodway in dark green, floodway fringe in pale green, stream corridors in blue, and woodlands visible from the NAIP photo imagery.

III. SUITABILITY OF SUBJECT PROPERTY FOR THE USES TO WHICH IT HAS BEEN RESTRICTED

Applicant's Response:

"Allowed by current zoning, the current use of the property is a commercial stable and farm. With the acreage and current improvements, it is suitable for that use. With the open space and utilizing those improvements, the property would also be suitable for small classes, small respite cabins and possibly a country store, if allowed by the Rural Tourism zoning."

The subject property is developed with a barn, riding stable, mobile home, and various other out-buildings. (Photos in Figure 6) Per Section 12-306-2 of the Zoning Regulations, permitted



uses in the A District include agricultural uses; animal hospital or clinic; commercial dog kennel; commercial greenhouse; commercial riding stable; detached dwelling; churches, parish halls, etc; schools; and country clubs. The property is suited for these uses.

Per Section 20-309B-2 of the Zoning Regulations, the following uses are permitted in the R-T District: outdoor recreation; open air theatre; places of social assembly; lodging; cultural centers, museums or similar uses; and agricultural uses. Accessory uses permitted include retail stores, commercial riding stable, and residential dwellings when associated with the tourism use as caretaker or manager. Based on the conceptual site plan, Attachment A, and the applicant's narrative of the use included earlier in this report, the proposed rural tourism use will include cabins, an activity center, a retail component to sell products made by the facility's guests, a dwelling unit for the caretaker, commercial riding stable, and trails for riding or walking. The property is suited to these rural tourism uses.

Staff Finding – The property is suited for uses permitted in the Agricultural Zoning District and is also suited for uses allowed within the Rural Tourism District as the purpose of the district is to permit uses that integrate with and maintain the rural character of the property.

IV. LENGTH OF TIME SUBJECT PROPERTY HAS REMAINED VACANT AS ZONED

Staff Finding – The property is currently developed with agricultural buildings and a mobile home for a farm employee.

V. EXTENT TO WHICH REMOVAL OF RESTRICTIONS WILL DETRIMENTALLY AFFECT NEARBY PROPERTY

Applicant's response:

"Rezoning and removing restrictions will NOT detrimentally affect nearby property. The uses proposed will be very similar to the current uses. The additional uses that would be possible by the rezoning would be low-impact/intensity activities. Applicant does not foresee traffic increasing much more than what is currently seen with the commercial stables of Coal Creek Farm. In addition, the surrounding area is also agricultural; therefore, rezoning to Rural Tourism would fit in with the surrounding agricultural zoning/uses. There are also current slopes and tree lines that act as natural buffers to the site."

Possible impacts from development typically include lighting, noise, and traffic. Per the conceptual site plan, the activity center is proposed to be located within the interior of the site. Cabins, agricultural uses, and walking or riding areas are proposed along the perimeter. Any proposed exterior lighting will be reviewed at the site planning stage to minimize any negative impacts such as light trespass or glare onto the neighboring properties. The subject property is located on N 1000 Road/County Route 458 which is a paved 'principal arterial' that is designed to handle larger volumes of traffic than local or collector roads.

The proposed use will be of a higher intensity than the existing use, but will not be a high impact or intensity use as a limited number of guests are anticipated at any one time due to the nature of the facility. As the property has direct access to a paved arterial road there should be no negative impacts associated with dust or increased traffic.

A 200 ft natural buffer area or other appropriate distance as determined by the Board of County Commissioners is required for Rural Tourism uses to insure that the rural character of the area is maintained and to minimize any negative impacts. The Zoning Regulations note that this buffer area shall be limited to agriculture or other low-impact uses. (Section 12-309B-3.02)

The purpose of the buffer area is to provide separation and buffering between the tourism use and adjacent uses. The proposed facility will include several uses which are permitted by right in the Agricultural District and which



currently occur on site; however, the cabins and activity center are uses which would require a CUP in the A District as they could have more impact on adjacent properties than agricultural uses.

The applicant requested a reduced buffer width of 100 ft on the west, south, and east side of the property and 0 buffer width on the north side. This request was based in part on the fact that the required 200 ft buffer would encumber approximately 2/3 of the total site area and the fact that their rural tourism use will be primarily agricultural in nature with low intensity activities. The following is a review of the buffer width reduction request:

BUFFER WIDTH REDUCTION REVIEW

SOUTH BUFFER

The activity center is planned for the southern side of the property. The drive and activity center parking area are shown within the 200 ft buffer area on the concept plan. The applicant requested that the buffer width along the south be reduced to 100 ft to allow the activity center parking area and drive to be located between the activity center and the road. Two concept plans are included in Attachment A; one with the 200 ft buffer width, the other with 100 ft. The 100 ft buffer area on the south would result in the drive and parking area being located outside of the buffer area. Landscaped screening for the parking area from N 1000 Road will be determined during the site planning process. The other uses proposed are located outside of the 200 ft buffer area, or are agricultural uses-such as the small horse stable identified as building A and would be permitted to be located within the buffer.

• Staff's recommendation is to reduce the buffer area width to 100 ft as needed to accommodate the parking and drive area for the activity center and cabins while maintaining the 200 ft buffer area for the remainder of the southern portion of the property. The location of the drive and parking area, and associated 100 ft wide buffer area, would be determined at the site planning stage.

EAST BUFFER

The subject property is adjacent to agricultural land to the east. The concept plan shows this area as pasture and riding areas. These would be considered low impact and agricultural uses which are permitted within the buffer area.

• Staff's recommendation is to maintain the 200 ft buffer area width on the east side of the property as there is no conflict with the proposed use and the required buffer area in this location.

WEST BUFFER

A residence is located on the parcel adjacent to the west property line. Three cabins are shown along the west side of the property on the concept plan. The cabins are located outside of the buffer area; however, the access drive to these cabins is within the buffer area. The applicant requested a reduced buffer area of 100 ft along the west side to provide flexibility with locating the cabins. It is necessary to provide 3 acres for a septic system each for cabin.

They also requested that the drive be considered a low-impact use as it will only provide access to the 4 cabins on site. Many of the trips from the cabin to the activity center, barn, or other out-buildings will be on foot or horseback. If the drive is located in the required buffer area, staff recommends restricting its use to accessing the 4 cabins to insure limited traffic. Landscaping would help minimize the visual impact of the drive to the property to the west. Staff recommends that additional landscaping, including a majority of evergreen species, be planted between the drive and the west property line if the driveway is located within the required buffer area.

• Staff's recommendation is to maintain the 200 ft buffer width and allow the location of the access drive to the cabins within the required buffer with the condition that a note be added to the site plan that this driveway use is restricted to providing access to 4 cabins. Landscaping should be planted along the west property line to screen the drive from the residence to the west.

NORTH

Rick Andrews, owner of the property to the north, provided a letter of support for the removal of the buffer along the north property line as he felt the tree line provided adequate buffering. This letter is included as Attachment B. A 100 ft buffer width on the north side of the property would include the tree line. Uses shown on the concept plan include the north cabin and its access drive.

• Staff recommends a reduced buffer width of 100 ft on the north side of the property based on the adjacent property owner's comments and the existing tree row. The 100 ft buffer area will allow space for the tree row and for perhaps a wider tree row to be developed through time to buffer the uses from the property to the north. The drive could be located within the buffer area with the same condition as noted above.

Staff Finding – Due to the low intensity and agricultural nature of the proposed use there should be no negative impact to neighboring property. Attention will be provided to screening, lighting, and site design and configuration through the site planning stage to reduce or minimize any negative impacts. This setback should adequately buffer the adjacent properties from the use, even with the reduced width of 100 ft on the north and the portion that would be reduced to 100 ft on the south to accommodate the activity center parking area and connection to the access drive. The drive to the west providing access to the cabins would be considered a low-impact use if a note were added to the site plan that the drive was limited to providing access to 4 cabins located on the west and north side of the property. Trees, with a majority being evergreen species, could be planted along the west side of the drive to screen it from the property to the west.

VI. RELATIVE GAIN TO THE PUBLIC HEALTH, SAFETY AND WELFARE BY THE DESTRUCTION OF THE VALUE OF THE PETITIONER'S PROPERTY AS COMPARED TO THE HARDSHIP IMPOSED UPON THE INDIVIDUAL LANDOWNERS

Applicant's response:

"Over the years there has been a significant rise in autism, and it continues to grow. Many of those diagnosed with autism years ago are now becoming adolescents and adults. The majority of the focus is on early intervention and the younger population, leaving limited options for those who are older. The applicant's approval and ability to do their project as planned will help fill those many needs and more that are not currently available. It will also be a place for volunteers and even students of KU to do internships and/or learn. Without the approval, applicant would be limited on the educational services, recreational therapy, and much needed respite they could provide."

Evaluation of these criteria includes weighing the benefits the denial of the rezoning request would provide for the public versus the hardship the denial would impose on the owner of the subject property. Benefits are measured based on the anticipated impacts of the rezoning request on the public health, safety and welfare.

If the rezoning were denied, the property would maintain its Agricultural zoning classification and could be used for agricultural purposes or developed with a use that is permitted within the A District. The proposed use could be achieved through approval as a Conditional Use; however, the applicant wanted a more permanent approval than is provided with the Conditional Use Permit so elected the R-T Zoning. The approval of the rezoning would provide a more permanent approval for the facility and would limit the permitted uses to those which are permitted in the R-T District with the intent to maintain and enhance the rural character of the area.

Staff Finding –There would be little, if any, gain to the public health, safety or welfare from the denial of the rezoning request. The proposed use would be possible under the A Zoning with a Conditional Use Permit; however, the R-T Zoning offers a more permanent approval for the use.

VII. CONFORMANCE WITH THE COMPREHENSIVE PLAN

Applicant's Response:

"The subject property lies within the Douglas County UGA (Urban Growth Area) and appears to fit much of the planned criteria/goals as specifically stated in the Horizon 2020 Plan. The proposed project will assist in the conservation of the rural character and natural features of the area, help preserve the environmental and ecological function of the area, it will allow a significant amount of 'green space', park and recreation for the public, the majority of the existing vegetation will be utilized (as well as additional vegetation planted), it will provide diverse educational opportunities to the special population with limited access to resources and it would help the progression of land uses to help achieve a transition in land uses and intensity levels." Chapter 4 of *Horizon 2020*, 'Growth Management', describes the future growth area for Lawrence as the Urban Growth Area (UGA) and establishes criteria for urban development in each service area of the UGA based on its proximity to city limits and availability of City services and infrastructure. The subject property is located within Service Area 4 which is the last service area that is expected to be annexed into the City and provided with City services; therefore, urban development is not anticipated for this area in the near future. The annexation policy recommends that land within the UGA be annexed into the city prior to urban densities of development.

The comprehensive plan distinguishes between the future growth areas of incorporated cities in the county and the remainder of the unincorporated area by designating the future growth area as the UGA (Urban Growth Area) and the remainder of the unincorporated area as rural. The term 'rural' then has various meanings. When used to describe a geographical location in the comprehensive plan it refers to the unincorporated portion of the county that is not within an Urban Growth Area. When used in general discussion, the term 'rural' refers to being 'in the country' as opposed to being within an urbanized area. The Rural Tourism zoning district uses the term 'rural' to refer to the non-urbanized areas rather than to areas that are located outside of the Urban Growth Area. Development and uses within the Rural Tourism District are intended to integrate with and enhance the rural character of the area. The agriculturally based use being proposed in this Rural Tourism District is in conformance with recommendations in the Comprehensive Plan regarding development within the UGA.

Chapter 4 also contains parameters for development within the rural area and includes 'rural tourism uses'. As rural tourism uses may occur in as well as outside of the UGA, the subject location is being reviewed with the following criteria recommended in the Comprehensive Plan (Page 4-4. *Horizon 2020):* (Staff discussion follows the criteria and is *italicized.*)

- 1) Has direct access to an improved arterial roadway. Subject property is located adjacent to, and has direct access to N 1000 Road, a principal arterial.
- 2) Public water supply available. *The property is serviced by RWD#1. Capacity is available and the applicant is discussing the logistics of service provision with the Rural Water District.*
- Separated from existing conference, recreation, or tourism facilities by at least 3 miles or other appropriate distance as determined by the Board of County Commissioners. *The proposed R-T District is approximately 3.5 miles northeast of another Rural Tourism Zoning District, Sadies Lake.*
- 4) Designed to preserve and/or integrate natural resources and the rural environment through appropriate land use, site design, buffering, or other methods. *The proposed uses will integrate with the rural environment. Site design, buffering, lighting review, and other measures will insure compatibility with the rural environment during the site planning process.*

STAFF REVIEW

The proposed rural tourism use consists of uses which are permitted in the Agricultural District such as agricultural uses and commercial stables. The proposed uses which would require approval of a Conditional Use Permit are the cabins, caretaker's dwelling, and the activity center. The proposed uses are permitted in the Rural Tourism Zoning District.

The property being rezoned is of adequate size to meet the standards of the R-T District, which are the same as those for the B-2 District. The proposed rezoning and subsequent land division would be in conformance with the frontage requirements in the access management standards. The proposed use and the proposed site layout are compatible with the rural character of the area.

The subject property meets the criteria for Rural-Tourism commercial zoning.







Figure 6c. View of subject property from N 1000 Rd.

MAATR On The Prairie

Conceptual Plan With Requested 100' Buffer (not exact scale)



EXISTING STRUCTURES:

A-SMALL HORSE STABLE

B-INDOOR RIDING ARENA

C—TEMP RANCH HAND HOME (move to NE)

D-OLD BARN

E-OUTBUILDINGS



ACTIVITY CENTER/OFFICES

OUTDOOR RIDING ARENA



PICNIC AND VIEWING AREA



ENTRANCE, PARKING, CIRCLE DRIVE

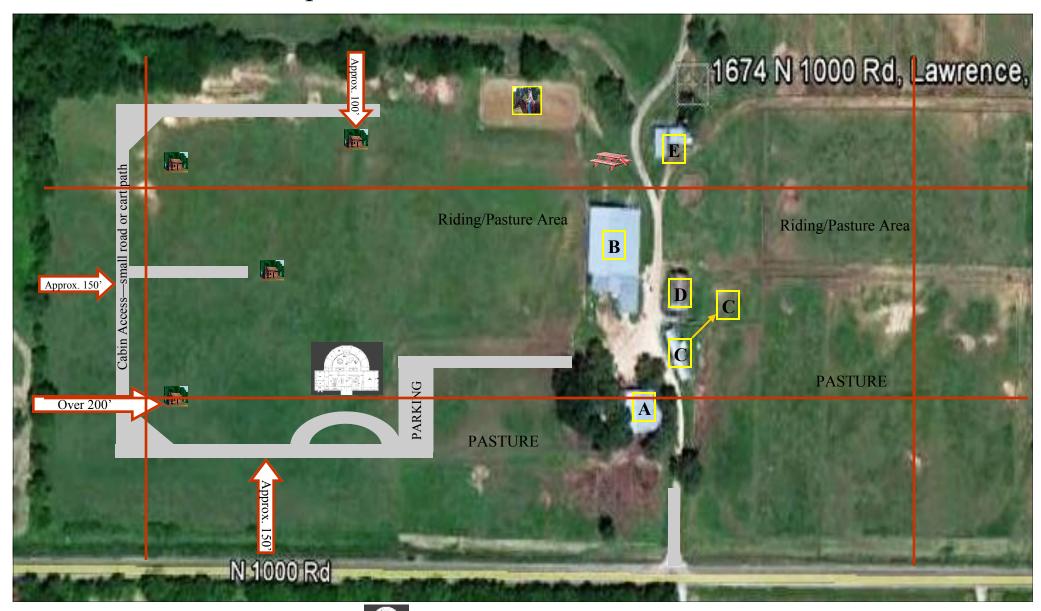




Estimated 100' Buffer Area (in square, beyond 100')

MAATR On The Prairie

Conceptual Plan w/200' Buffer (not exact scale)



EXISTING STRUCTURES:

A—SMALL HORSE STABLE

B—INDOOR RIDING ARENA

C—TEMP RANCH HAND HOME (move to NE)

D-OLD BARN

E—OUTBUILDINGS



ACTIVITY CENTER/OFFICES



PICNIC AND VIEWING AREA

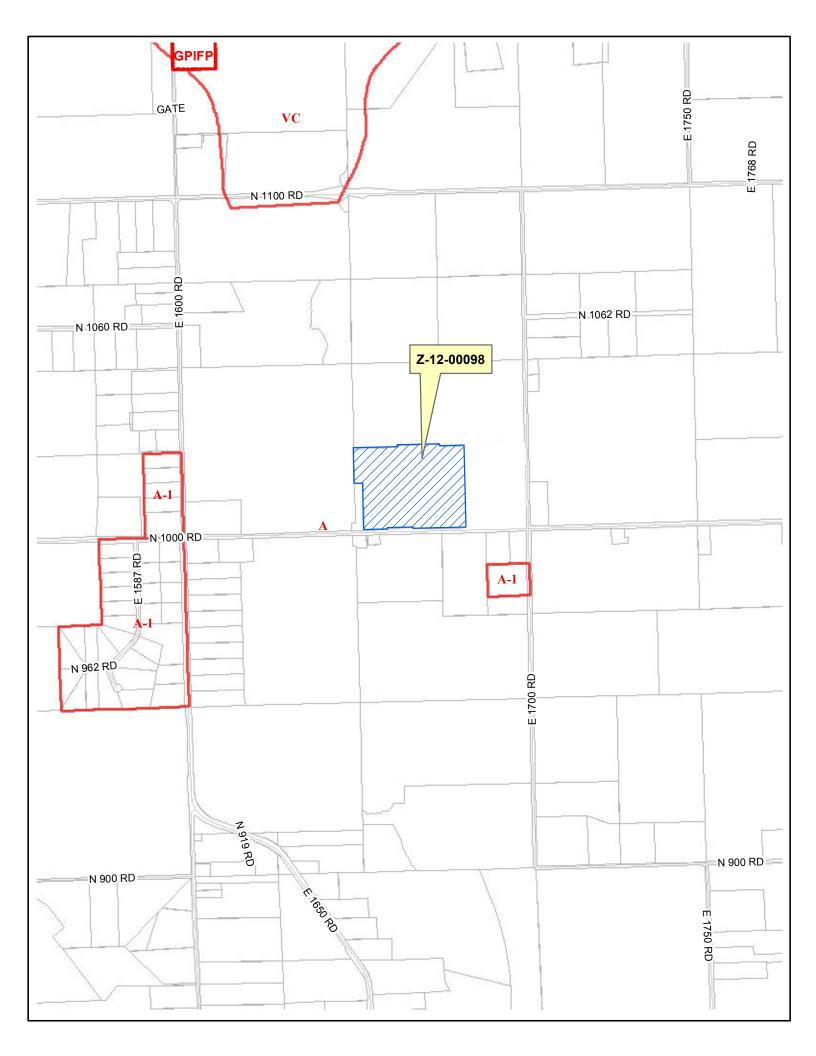


ENTRANCE, PARKING, CIRCLE DRIVE



Estimated 200' Buffer Area (in square, beyond 200')

OUTDOOR RIDING ARENA



1033 E 1700 Rd Lawrence,KS September 20, 2012

Mary Miller City/County Planner P.O. Box 708 Lawrence, KS 66044

Mary:

Please accept this letter as our approval for MAATR to forgo the 200' set back along proposed North and East property lines. As we would be the property owners adjacent to the North, and also the East. We feel the existing tree line would be a sufficient buffer on the North. Regarding proposed East line, we would welcome any activity, especially a structure as this would be an added protection for our Alpacas.

Sincerely, B ///c

Rick Andrews

MAATR Buffer Reduction Request

We appreciate staff's recommendation for approval on the RT rezoning and willingness to work with us on the reduction of the buffer area; however, if our calculations are correct, the buffer area, as recommended by staff, is still approx 45% of our proposed area. The majority of our plan is agriculturally related and the other activities will involve a low number of users and it is anticipated it would not be much busier than the current allowed use of a commercial stable. It is also our understanding that no public comment had been received about any issues with our proposal of use for the property. With that being said, we would like to request the following:

1. NORTH BUFFER REMOVED

There is an existing tree line along the north property line that acts as a natural buffer that we will keep in place. In addition, there is a significant distance to the residential cabin to the north, owned by Rick and Vickie Andrews. We already have a letter from Mr. & Mrs. Andrews, adjacent property owners to the north and east stating they are in favor of removing the north and east side buffers alike.

Having the septic south (down hill) of the cabins would help with the flow to the fields. That might require having the cabins just a bit more north.

2. EAST BUFFER REMOVED

The Andrews plan on having a vineyard to the east of our proposed property. As you will see in their letter, they feel having more activities on the east will also protect their alpacas better. We would like to have the option in the future to expand on our services toward the east, as requested by the Andrews, which would limit the need for expansion to the west and south.

3. WEST BUFFER 100'

Mr. McLear of MAATR spoke with Mr. Evans, property owner to the west to explain our plans there. He has no problems with what we are planning on doing. Though we do not plan on having any high-impact uses, we would like to have a little more room and options for the future.

4. SOUTH BUFFER 100'

Staff had already recommended a reduced buffer of 100' for the parking and drive area. Any other use we would have just outside of that 100' foot buffer would not be any higher impact that a parking/drive area would be anyway.

We are concerned that our board of directors might have a problem with such a drastic reduction in the space we will have to work with. Coal Creek Farm is an ideal location for our project; however, if we are limited on almost half of the land, it makes it less appealing to the board of directors. We feel the general public would benefit greatly from MAATR's proposed uses. We appreciate your consideration of our requests.

Memorandum City of Lawrence Planning & Development Services

- TO: Planning Commission
- FROM: Sandra Day, Planning Staff
- CC: Scott McCullough, Planning and Development Services Director Sheila Stogsdill, Assistant Planning Director
- Date: For September 24, 2012 meeting
- **RE:** Misc Item 1: Variance associated with Minor Subdivision for Grand Addition, (MS-12-00092);
 - 1. From the 150 ft right-of-way requirement in Section 20-810(e) (5) for arterial streets to allow the right-of-way for Kasold Drive to remain at 100 ft.
 - 2. From the sidewalk requirement in Section 20-811 (c) for a sidewalk on both sides of the street.

Attachment A: Minor Subdivision MS-12-00092, Grand Addition No. 2

Attachment B: Public Improvement Plan for relocated recreation path

The subject property is located at 3400 and 3401 Aldrich Street. The Grand Addition No. 2 Minor Subdivision/Replat [MS-12-00092] proposes to divide two corner lots into four lots on the north and south sides of Aldrich Street. Minor Subdivisions are processed administratively but Planning Commission approval is currently required for variances from the Subdivision Design Standards. A copy of the Minor Subdivision is included with this memo for context; however, no action is required on the Minor Subdivision.

The Subdivision Regulations state that an applicant may request a variance from the Design Standards in the Regulations in accordance with the variance procedures outlined in Section 20-813(g). This section lists the criteria that must be met in order for a variance to be approved. The requested variance is evaluated with the approval criteria below:

1. From the 150 ft right-of-way requirement in Section 20-810(e) (5) for arterial streets to allow the right-of-way for Kasold Drive to remain at 100 ft.

Kasold Drive is classified as an arterial street in the Future Thoroughfares Map. Per Section 20-810(e) (5), 150 feet of right-of-way must be dedicated for arterial streets when platting property. The applicant is requesting a variance from this requirement to allow the right-of-way to remain at 100 ft.

The property on each side of the street is responsible for dedicating one-half of the required right-ofway; therefore, an additional 25 feet would be required along the length of the residential lots. 2. From the sidewalk requirement in Section 20-811 (c) for a sidewalk on both sides of the street.

The subdivision was originally developed in the early 2000's. At the time the subdivision was approved sidewalks were only required to be provided on one side of the street. This subdivision was developed with a public sidewalk along the north side of Aldrich Street that connects to the recreation path along Kasold Drive. The Minor Subdivision includes the division of two platted lots into four platted lots, two lots on each side of Aldrich Street. Only the south side lots are affected by the requirement to include sidewalks.

Criteria 1. Strict application of these regulations will create an unnecessary hardship upon the Subdivider.

Applicant Response:

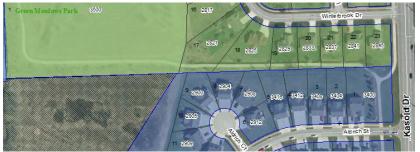
The 50 foot was deemed acceptable when the property was originally platted in 2000 and the Subdivision was created. The right-of-way width was adequate for the reconstruction of Kasold. Increasing the Right-of-Way now would result in non-conforming lot and would negate the Minor Subdivision.

Only one side of the street required sidewalks when originally platted in 2000. If required to provide sidewalks for these lots it would be the only segment of sidewalk on the south side.

This property was platted in November 2000. The right of way requirement at that time for an arterial street was 100'. The subdivision regulations were changed to require 150' in 2006. Kasold Drive was recently reconstructed in (2011). The life span of this improvement is expected to last 50 years. There are no plans to add a median along this segment of Kasold Drive. The dedication of an additional 25' would result in a lot smaller than proposed. As a corner lot, additional area is recommended in the subdivision regulations to offset the additional building setbacks that are often applicable and to provide separation of the living area from the public right-of-way.

The recent reconstruction of Kasold Drive and the expected longevity of the improvements negate the need for the applicant to dedicate additional right-of-way that will not be used is a hardship to the applicant.

This project involves a substantial investment in relocating the recreation path from its current alignment to the revised alignment along Kasold Drive and reconfiguration the connection of the path along the north line of the subdivision to Green Meadows Park.



Staff Finding: Requiring the dedication of additional right-of-way for Kasold Drive would decrease the distance between the planned residences and the right-of-way line. The dedication would

constitute an unnecessary hardship on the property owner, as the additional right-of-way is not needed for future street improvements.

Aldrich Street is approximately 930' long. Requiring the construction of the sidewalk for east 137' along the south side of Aldrich would be an unnecessary hardship on the property owner. Pedestrian access terminates at the cul-de-sac with no cross access out of the subdivision to the south. There are no planned connections around this subdivision other than the existing recreation path along Kasold Drive. This sidewalk is not needed to fill in designated gaps in the City's sidewalk gap program.

Criteria 2. The proposed variance is in harmony with the intended purpose of these regulations.

Applicant Response:

The presently configured plat was acceptable under the existing Subdivision Regulations in 2000. No other part of Kasold Drive from 23rd Street to 31st Street has the additional Right-of-Way dedicated so dedicating additional for this property would be an anomaly more than the norm.

The subdivision design approved in 2000 did not require a sidewalk on both sides of the street. No other portion of Aldrich Street would have a sidewalk along the south side.

Right-of-way dedication is required when properties are platted to insure the required right-of-way is available for improvements to adjacent roadways. No additional improvements are anticipated for this segment of Kasold Drive that would require additional right-of-way. The City Engineer has no objection to the right-of-way remaining at 100 ft.

Sidewalks generally support alternative (non-motorized) means of transportation. Aldrich was constructed with a sidewalk on the north side of the street provided general pedestrian access to the recreation path to Kasold Drive. The remainder of the subdivision is unaffected by the proposed Minor Subdivision. The Minor Subdivision process is generally administrative and usually does not include public improvements. This project is unique in that the existing recreation path will be demolished and reconstructed within the Kasold Drive right-of-way to accommodate the two new lots. No additional improvements to the street and sidewalk facilities are anticipated for Aldrich Street. The City Engineer has no objection to the exclusion of sidewalk along this segment of Aldrich Street.

Staff Finding: Allowing the right-of-way to remain at 100 feet would continue the established development pattern of Kasold Drive. The additional right-of-way is not necessary for planned street improvements. The variance is in harmony with the intended purpose of these regulations.

This Minor Subdivision represents a very small change in the overall development of a street ending in a cul-de-sac. No plans exist to provide pedestrian connection to the south out of the subdivision. It is unlikely that sidewalk would be constructed the full length of the remaining street segment. This variance is in harmony with the intended purpose of these regulations.

Criteria 3: The public health, safety, and welfare will be protected.

Applicant Response:

The public health, safety, and welfare will be protected in as much as they are under the presently configured plat. The existing Right-of-Way and sidewalk facility is sufficient to provide safety and welfare of pedestrians and motor vehicles on Kasold Drive.

This property is the subject of a minor subdivision request to accommodate infill development. Sufficient right-of-way and easement exist to accommodate the necessary infrastructure to serve this property. The variance affects only the south two lots since sidewalk along the north side of Aldrich Street was constructed initially.

Staff Finding: Maintaining the current right-of-way width for Kasold Drive in this area will help maintain the development pattern.

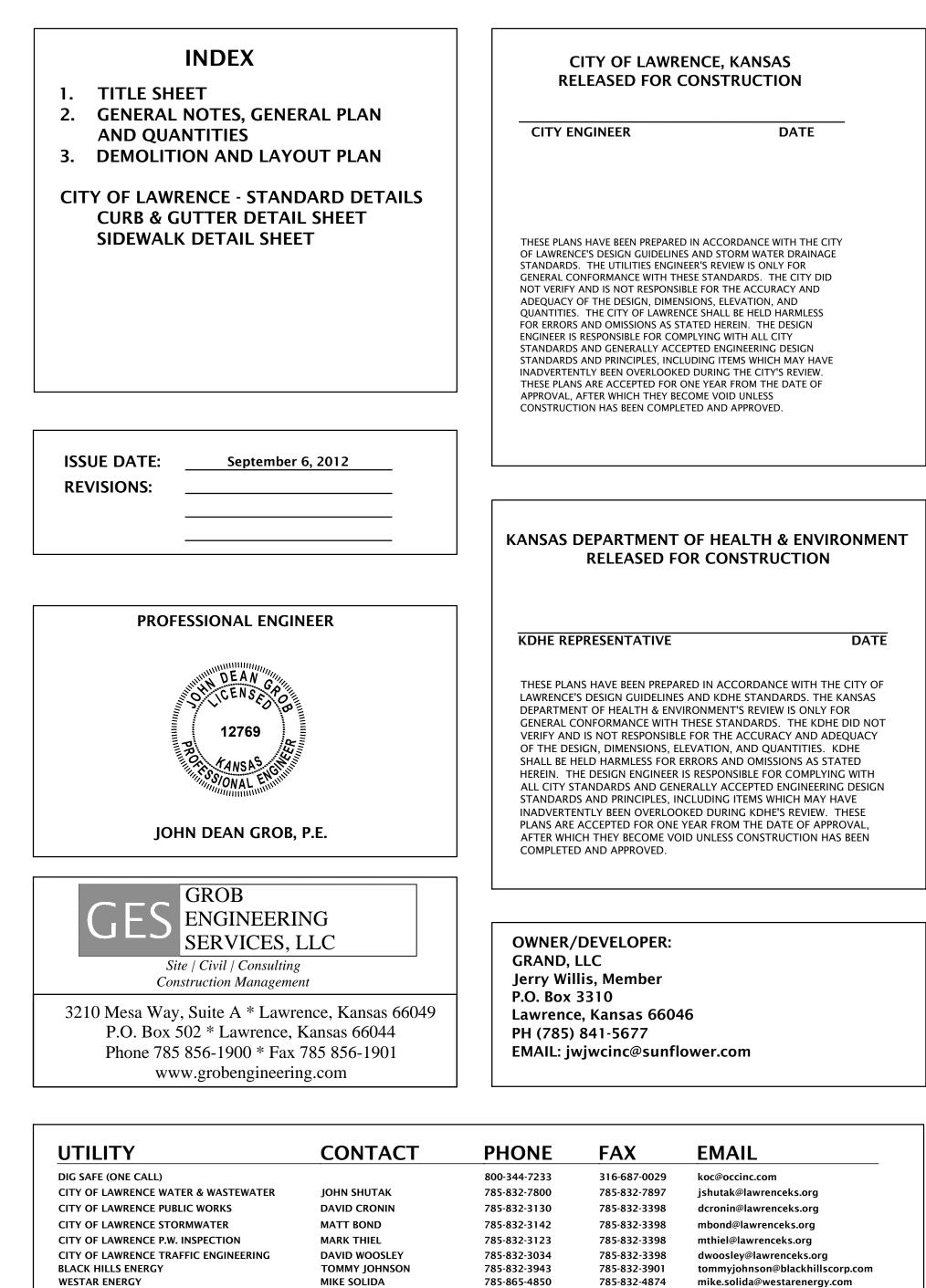
Sidewalk is provided along the north side of Aldrich Street that dead-ends in a cul-de-sac. Only local traffic occurs on Aldrich Street.

The public health, safety, and welfare will not be negatively impacted with the granting of these variances.

Staff Recommendation:

- 1. Approve the variance requested from Section 20-810(e)(5) to allow the Kasold Drive right-ofway in this location to remain at 100 feet, rather than the 150 feet required by Code.
- 2. Approve the variance requested from Section 20-811(c) to forego the construction of sidewalk along the south side of Aldrich Street.

GRAND ADDITION NO. 2 RECREATION PATH RELOCATION IMPROVEMENTS CITY OF LAWRENCE PROJECT NUMBER _____



KEITH GATZMEYER

HARV WAYMIRE

785-276-6146

785-312-6922

785-276-6100

785-832-6940

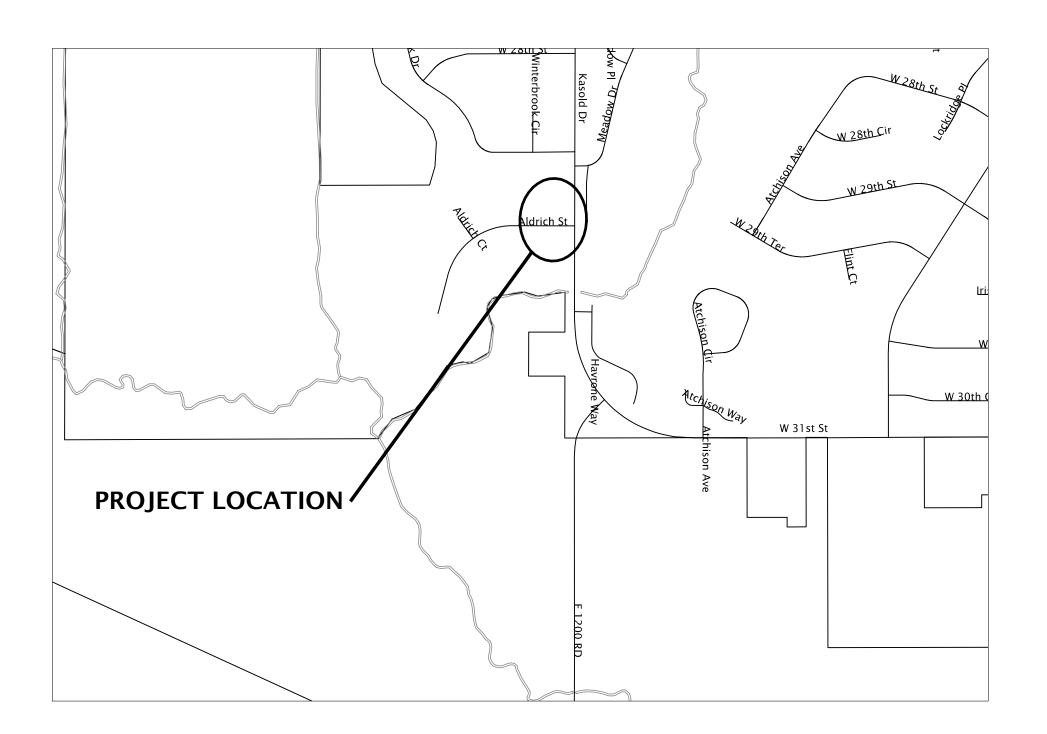
kg4306@att.com

ATT

KNOLOGY

james.waymire@knology.com



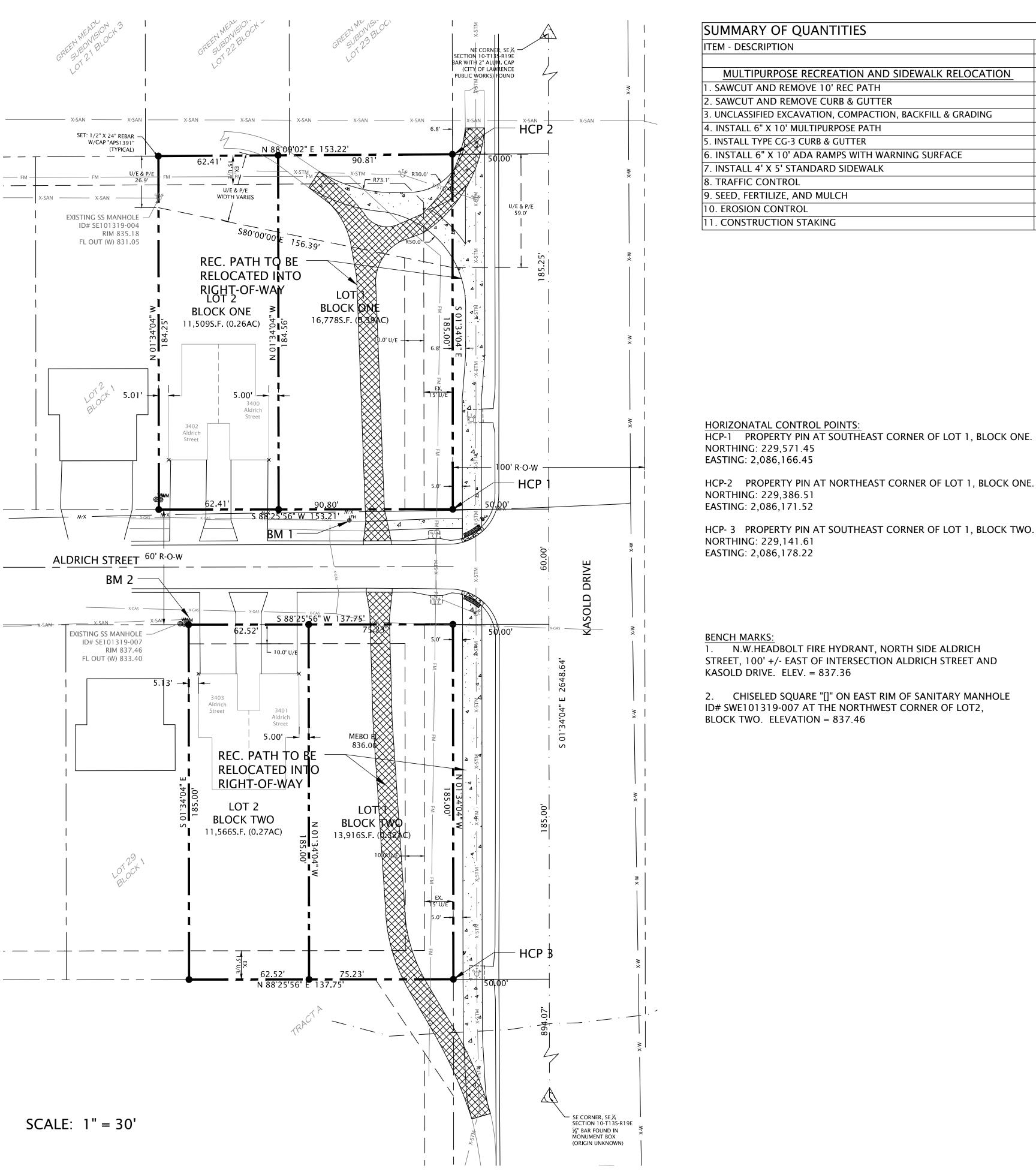


IEERING CES, LLC	CBOR	Grand Additon No 2	
City Project	ENGINEERING	Recreation Path Relocaiton Improvements	Date: September 6, 2012
	SERVICES, LLC	City Project #	

NOTES - GENERAL AND SIDEWALK

- 1. The contractor shall have one (1) signed copy of the plans (approved by the City Engineer) and one (1) copy of the appropriate Construction Standards and Specifications at the job site at all times.
- 2. The specifications for this project shall be current City of Lawrence, Kansas standard specifications, and shall govern for all items of work shown on these plans unless otherwise noted.
- 3. Contractor shall maintain drainage during construction and is responsible for any dewatering necessary for construction.
- 4. Contractor shall not be allowed to work Sunday or all state holidays without approval from the City of Lawrence. 5. The utility information shown herein is based on the information available to the engineer at the time of design. The contractor shall be responsible to call 1-800-DIG-SAFE and confirm that all utilities have been located by the respective utility owner prior to any project excavation work. The contractor shall verify all utility depths and locations prior to construction. Key locations, as noted, shall be located vertically and horizontally by utility owner and/or utility owner shall be present onsite for location prior to excavation. The contractor shall coordinate any utility conflicts with the respective utility company. The contractor shall protect existing utilities at all times. Relocation of existing utilities by the contractor must be coordinated with and approved by the utility owner, the City of Lawrence, and the engineer. Utilities damaged through the negligence of the Contractor to obtain the location of same shall be repaired and replaced by the contractor.
- 6. The contractor shall give notice to the City 48 hours in advance of beginning construction work on existing streets and utilities and new streets and utilities. 7. All clearing, grubbing, and tree removal necessary to accomplish this project shall be performed by the contractor under the lump sum price bid for
- "clearing and grubbing". The removal of all drainage structures, curbs, pavements, and other undesirable material shall be considered subsidiary to the bid item clearing and grubbing. All clearing debris shall be disposed of by the contractor off-site in accordance with the City of Lawrence, Kansas regulations. 8. All earthwork on this project shall be classified as 'unclassified excavation' unless otherwise designated on the plans.
- 9. All storm sewer and waterline trench backfill shall be compacted in accordance with the city of Lawrence specification unless otherwise noted. All storm sewer and waterlines crossing proposed streets shall be backfilled to the subgrade of the pavement and to a point at least two feet beyond the back of curb or two feet back of sidewalk with flowable mortar conforming to city specifications. All structures placed within street R.O.W shall be backfilled around the perimeter up to the subgrade of the pavement with flowable mortar. Curb inlets, junction boxes, area drains, etc are considered structures. This backfill shall be subsidiary to the structure bid item, except flowable mortar.
- 10. The Storm Water Pollution Prevention Plan as shown in this set of plans will be strictly enforced by the City. 11. All areas disturbed during construction shall be fertilized, seeded, and mulched by the contractor in accordance with current city of Lawrence standard specifications.
- 12. Upon completion of seeding, the contractor shall provide permanent markers at drainage easements as specified. Markers shall be placed as directed by a registered surveyor. Markers shall be yellow, 3' tall, permastake performance posts manufactured by Reliable Golf Course Supplies or equal. Posts shall be labeled with ¾" letters reading 'drainage easement marker - Do not remove.' Markers shall be placed over #4 rebar, 36" long, driven 18" into the around.
- 13. All structures, fences, pavement, and other improvements disturbed by construction activities shall be restored by the Contractor to original or better conditions. 14. All signing, barricades and drums utilized in traffic control shall be provided, erected, and maintained by the Contractor. Traffic control shall be in
- conformance with the Manual of Uniform Traffic Control Devices (MUTCD), latest edition, and approved by the City Engineer. 15. During the period of one year from the date of final acceptance by the city, the contractor is responsible for making any necessary repairs arising out of defective workmanship or materials. This includes, but is not limited to, trench settlement of storm sewers and waterlines constructed as a part of this project. The contractor is responsible for repairing all trench settlement including removing and replacing sidewalk, street, driveways and entrance walks constructed since the project was accepted by the city. Representatives from the city and the contractor shall conduct an inspection of this
- project 11 months after the project has been accepted by the city to determine what repairs need to be made. 16. Requirements for riprap designated at various locations on the plans will be according to the 2007 edition of the KDOT standard specs for the state road and bridges subsection 1116. 18" nominal diameter riprap will comply with 1116.02(b), stone for riprap, class-Light 18". If the contractor can not obtain these materials from local suppliers, gradations, and specific gravity test data must be submitted to the City Engineer for review and approval of proposed substitute materials.
- 17. The construction staking is to be provided by the contractor. Survey stakes, benchmarks, and property pins destroyed by the contractor shall be replaced at the contractors expense. Top of curb elevations shown do not represent any knock downs for sidewalk ramps or driveways.
- 18. Inspection services provided by the City are to be paid by the owner. 19. The removal of all drainage structures, curbs, and pavements designated for removal on the drawings shall be considered subsidiary to the bid item clearing and grubbing.
- 20. Storm sewer bid items shall include trenching, embedment, backfill, pipe, and all other labor, materials, and equipment required to install the storm sewer according to the plans. All storm sewer trench backfill shall be compacted in accordance with the City specifications unless otherwise noted. 21. All storm sewer lengths shown an plans are from center of structure to center of structure. Stations and offsets for curb inlets and manholes are to the center of structures.
- 22. Saturday work requiring city inspection services shall be coordinated with the City Inspector. Contractor shall provide notice by close of business Thursday prior to Saturday work. Saturday work shall be allowed based upon availability of the City inspection staff.

LEGEND				
	OHE UGT GAS	OVERHEAD WIRE OVERHEAD ELECTRICAL UNDERGROUND TELEPHONE GAS WATERLINE	B/B ROW C/L D/E U/E	BACK OF CURB TO BACK OF CURB RIGHT-OF-WAY CENTERLINE DRAINAGE EASEMENT UTILITY EASEMENT
SAN FM	SAN FM	SANITARY SEWER LINE SANITARY FORCE MAIN STORMWATER LINE	A/E (P) (M)	CROSS-ACCESS EASEMENT PLATTED MEASURED
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T AND REMOVE CURB & GUTTER	L.F.	24
SIFIED EXCAVATION, COMPACTION, BACKFILL & GRADING	L.S.	1
. 6" X 10' MULTIPURPOSE PATH	S.F.	5964
TYPE CG-3 CURB & GUTTER	L.F.	24
- 6" X 10' ADA RAMPS WITH WARNING SURFACE	EA.	2
4' X 5' STANDARD SIDEWALK	L.F.	23
CONTROL	L.S.	1
ERTILIZE, AND MULCH	L.S.	1
ON CONTROL	L.S.	1
RUCTION STAKING	L.S.	1

N.W.HEADBOLT FIRE HYDRANT, NORTH SIDE ALDRICH

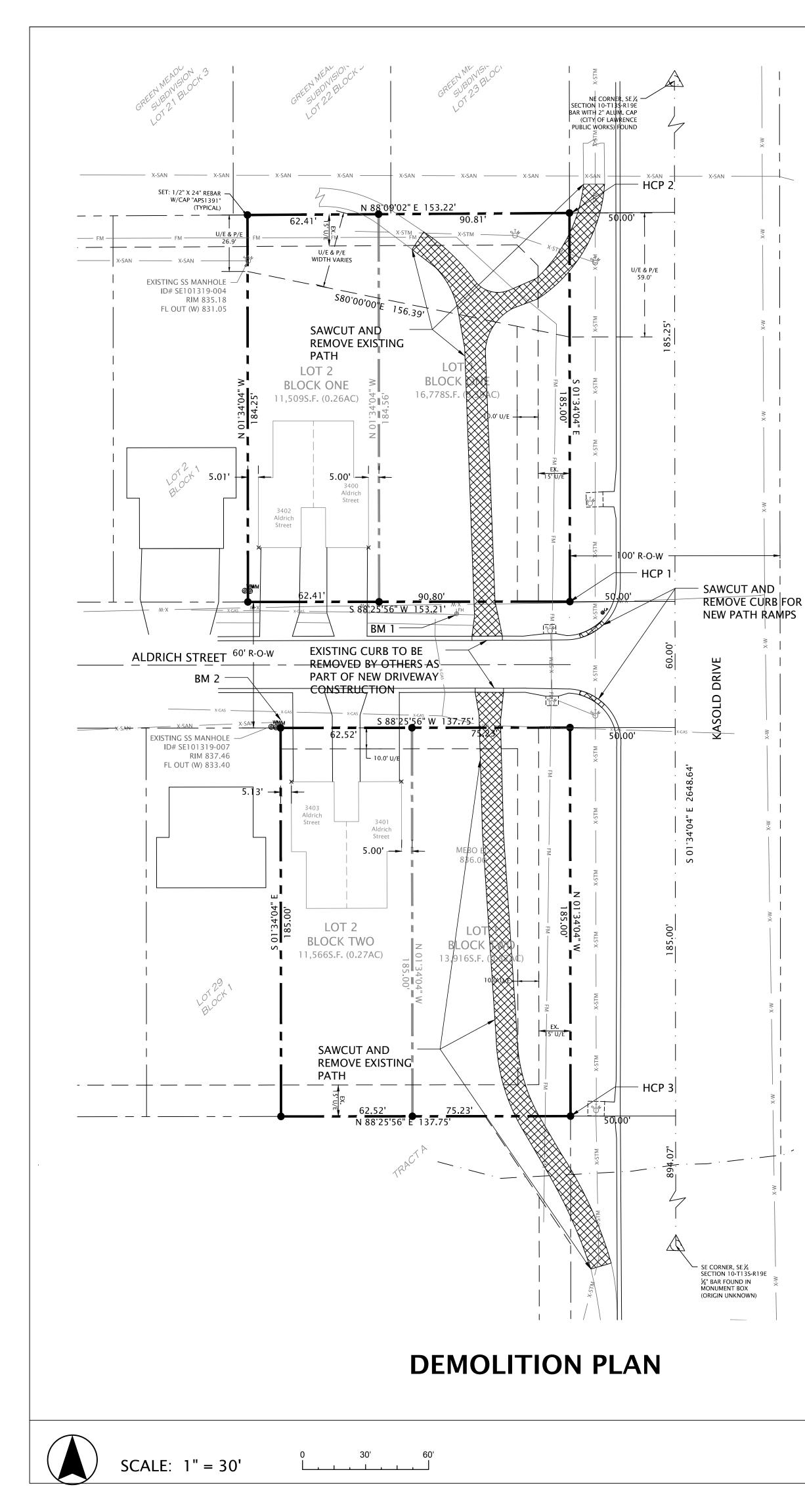
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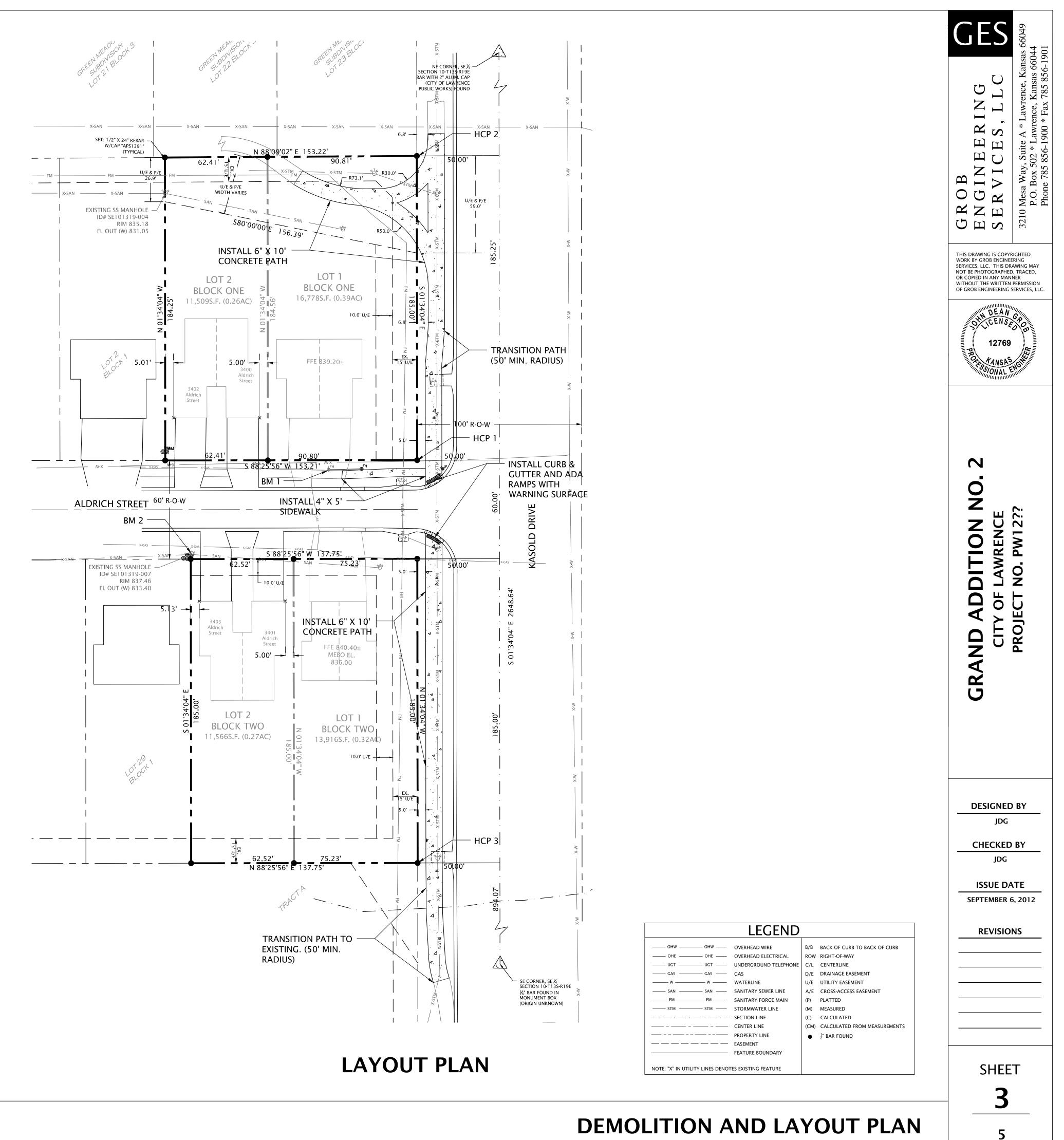
MULTI

SAWCUT

GENERAL NOTES, GENERAL PLAN AND QUANTITIES

GES	sas 66049 044 901
GROB ENGINEERING SERVICES, LLC	3210 Mesa Way, Suite A * Lawrence, Kansas 66049 P.O. Box 502 * Lawrence, Kansas 66044 Phone 785 856-1900 * Fax 785 856-1901
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GRAND ADDITION NO. 2 CITY OF LAWRENCE	PROJECT NO. PW12??
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MINOR SUBDIVISION

September 4, 2012

MS-12-00092: Grand Addition No. 2, a minor subdivision/replat of Lot 1 and Lot 30, Grand Addition. A four-lot division located at 3400 and 3401 Aldrich Street. Submitted by Dean Grob for Jerry Willis, Grand, LLC, property owners of record.

ADMINISTRATIVE DETERMINATION: The Planning Director approves the Minor Subdivision for Grand Addition No. 2, subject to the following conditions:

- 1. Provision of an executed Master Street Tree Plan per Section 20-810(g) per the City Horticulture Manager's approval.
- 2. Provision of a revised Minor Subdivision plat with the following changes:
 - a. Provide a note on the face of the drawing to indicate the date of approval and the specific variance granted.
 - b. Provide additional dimension along the east side of Lot 1, Block 1 tro dimension the new utility and pedestrian easement. Show distance form Lot corner to south end of easement.

KEY POINTS

- This request is for the division of two lots into four lots located on the north and south sides of Aldrich Street. The property is being divided to accommodate two new duplex structures on the resulting new lots.
- Each lot is currently developed with a duplex structure.

SUBDIVISION CITATIONS TO CONSIDER

- This application is being reviewed under the Subdivision Regulations for Lawrence and Unincorporated Douglas County.
- Section 20-810(e)(5)(i) requires 150 ft of right-of-way for arterial streets.
- Section 20-811 (C) requires sidewalks on both sides of a street.

ASSOCIATED CASES/OTHER ACTION REQUIRED

- Submittal of signed mylar copy and recording fees for recording of Minor Subdivision at the Register of Deeds.
- The applicant shall provide certification that all taxes that are due and payable have been paid prior to the recording of the plat.

GENERAL INFORMATION

Current Zoning and Land Use:	RM12D (Multi-Dwelling duplex lots.	Residential)	District;	existing
Surrounding Zoning and Land Use:	RS7 (Single-Dwelling development to the north	,		esidential

RM12D (Multi-Dwelling Residential) District; to the west and south. Open area surrounding subdivision is platted as dedicated drainage easement and encumbered by regulatory floodplain.

PD – [Meadows Place PRD] to the east; Existing residential development and floodplain for Atchison Tributary.

1.234 acres
2
28,287 SF
25,484 SF
4
16,778 SF
11,509 SF
13,916 SF
11,566 SF

STAFF REVIEW

This minor subdivision includes the division of two developed lots into four lots to facilitate additional development along Aldrich Street. Lot 1 and Lot 30, Block 1 of the original subdivision were platted as large lots with significant easement adjacent to Kasold Drive. This large easement provided dedicated space for the multi-use path, utilities, and a landscape berm along Kasold Drive. Per Section 20-801(e)(2) of the Subdivision Regulations, a Lot of Record or Parcel in the city that was created before the effective date of this article may be used for residential purposes for a detached dwelling or for another use that is allowed in the UR (Urban Reserve) District without further review under this article, until such lot of record or parcel is further subdivided. The subject property consists of two platted lots, which were created prior to the effective date of the Subdivision Regulations, but the division of these lots requires approval through a Minor Subdivision/replat. The lots being created through this Minor Subdivision conform to the minimum dimensional and area requirements of the RM12D zoning District.

RIGHT-OF-WAY

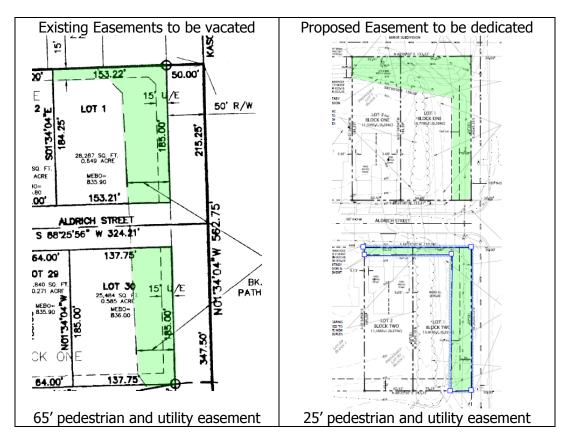
The Major Thoroughfares Map classifies Aldrich Street as a local street and. Kasold Drive as a principal arterial street. The Subdivision Regulations require 60 ft. of right-of-way for local streets and 60 ft. was dedicated with the Grand Addition. No additional right-of-way is required for Aldrich Street. A principal arterial street requires 150' in the current design standards. A total of 50' was dedicated for Kasold Drive as per the design standards at that time. A principal arterial street without a median required only 100' of right-of-way at the time this property was originally platted. This segment of Kasold Drive was reconstructed last year. The City Engineer indicated he would have no objection to a variance from the requirement to dedicate additional right-of-way. The Planning Commission will consider the variance at their meeting scheduled for September 24,

2012 from the requirement in Section 20-810(e)(5)(i) to provide 150 ft of right-of-way for a principal arterial to allow the Kasold Drive right-of-way to remain at 100 ft at this location. This variance should be noted on the plat prior to recording the drawing with the Register of Deeds Office.

In addition to public streets, sidewalks are also required on both sides of a street per Section 20-811 (c). This project includes a variance from providing a sidewalk along the south side of Aldrich Street. The City Engineer indicated he would have no objection to a variance from the requirement to construct a sidewalk along this street segment. The Planning Commission will consider the variance at their meeting scheduled for September 24, 2012 from the requirement in Section 20-811(c) to provide a sidewalk on both sides of the street. This variance should be noted on the plat prior to recording the drawing with the Register of Deeds Office.

UTILITIES/EASEMENTS

Adequate utilities are available to serve the lots. This project includes the vacation of several existing easements originally platted to accommodate the creation of the new lots and developable area within these new lots. The vacation request is being processed through the Public Works Department and scheduled to be considered by the City Commission on September 18, 2012.



The current 15' perimeter easement along Kasold Drive would remain. The existing utility and pedestrian easement would be reduced from 50' to a 10' utility easement as shown on the

proposed minor subdivision drawing. A new utility and pedestrian easement will be dedicated across the northern portion of Lots 1 & 2, Block 1.

The existing recreation path, located in the existing easement will be relocated into the existing right-of-way at the developers expense with this project. Some additional dimension of the drawing is recommended to clearly identify the new utility and pedestrian easement.

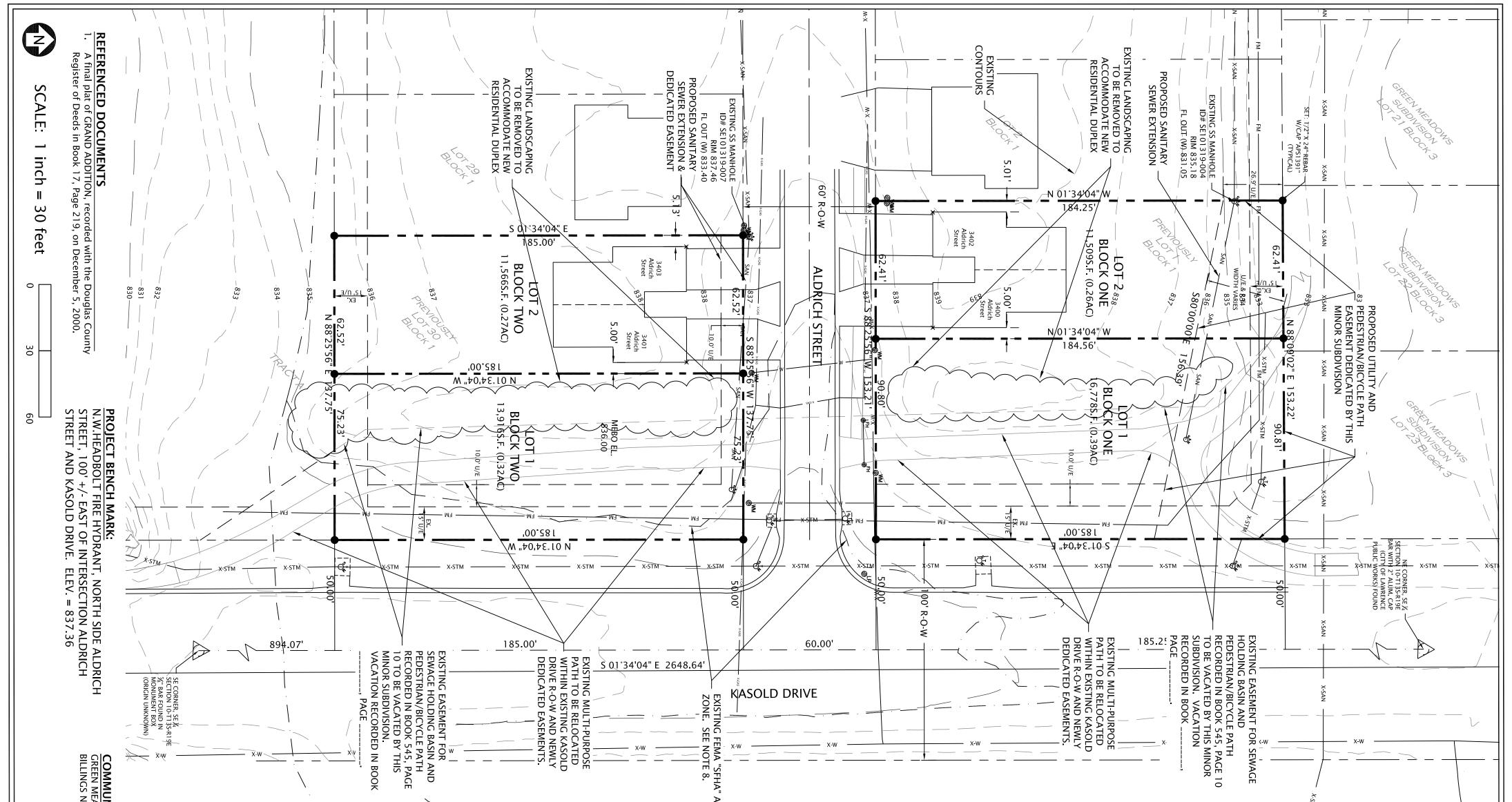
ACCESS

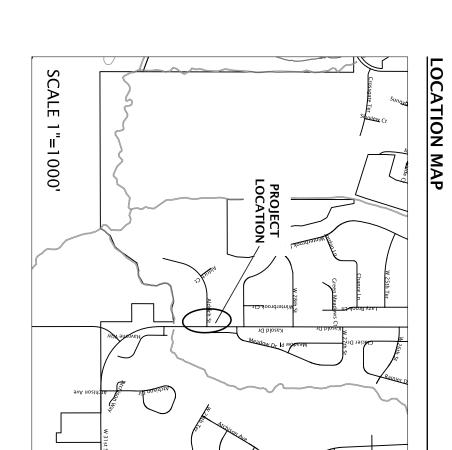
Aldrich Street provides direct access to the lots. Direct access to Kasold Drive is not recommended or proposed with this project.

MASTER STREET TREE PLAN

A Master Street Tree Plan is required with this plat. The street tree plan requires revision to the legal description and the City Horticulture Manager suggested other species than the proposed Maple. A Master Street Tree Plan, which is acceptable to the City Horticulture/Forestry Manager, must be executed prior to the recording of the minor subdivision plat.

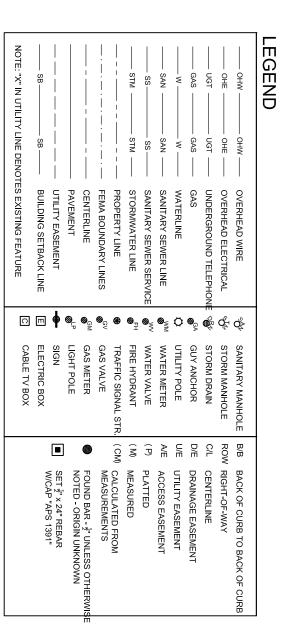
Conclusion: The Minor Subdivision, as conditioned, and with the variances pending approval by the Planning Commission, conforms to the approval criteria in Section 20-808(d) conforms to the approval criteria in Section 20-808(d) of the Subdivision Regulations.





Prepared September 6, 2012





LEGAL DESCRIPTION LOT 1 & LOT 30, GRAND ADDITION, A SUBDIVISION IN THE CIT COUNTY, KANSAS. THE ABOVE CONTAINS 1.234 ACRES, MORE

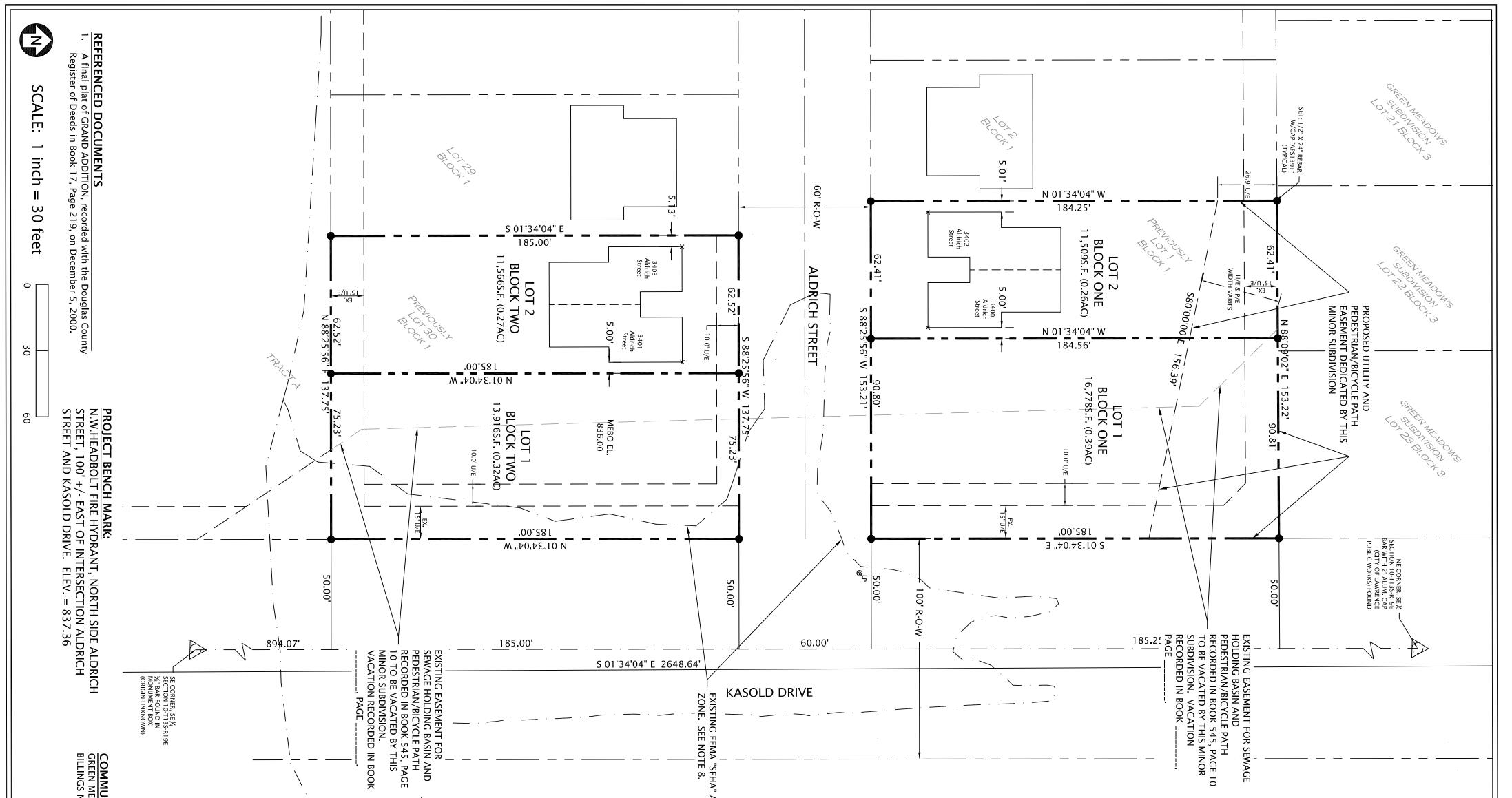
- NOTES
- 2

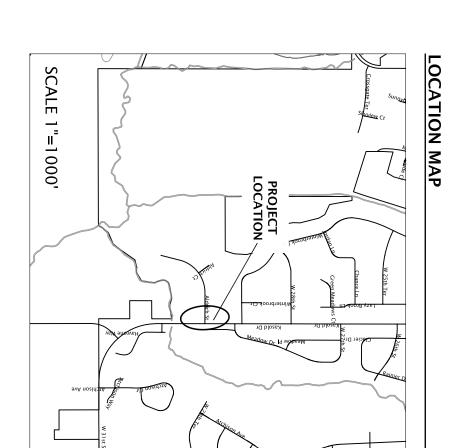
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- NOTES
 Basis of Bearings for this Minor Subdivision is the East Quarter Section 10-T13S-R19E, Crand Addition (N01'32 Quarter Section or consolidation of any Lots contained in this 1 prohibited, and shall be processed as a Major Subdivision the exception noted in Section 20-808(c)(5)(i).
 Aerial and topographic Information obtained from aeri Sanborn Mapping for the City of Lawrence and Dougla: respectively. Specific topographic and boundary inform directly adjacent obtained from field survey provided to 2012.
 Street trees shall be provided in accordance with the N with the Register of Deeds Book _______, Page______ the property owner is responsible for replanting trees on the right-of-way can be removed without the permis Lawrence Parks Department. Trees within the right-of-protection within 10' radius of the tree trunk. Street tr 8' separation from any public sanitary sewer line.
 The property within this Minor Subdivision/Replat is zo construction shall conform to the setback regulations of defined by the City of Lawrence Development Code.
 No portion of existing Lot 1 is located within a designa Area" per FEMA Map Number: 20045C0167D, Map Rev Existing Lot 30 is partially encumbered by Zone AE of with a Base Flood Elevation of 834.0 per FEMA Map Nu Revised: August 5, 2010. A MEBO elevation of 836.0 s lot.
- 9. a. This Minor Subdivision/Replat does not modify the existing Aldrich Street or Kasold Drive. No Street improvement improvements proposed with this Minor Subdivision/R the multi-purpose sidewalk/trail back into the existing The sanitary sewer infrastructure will extended to procosts for relocating the multi-purpose sidewalk/trail a infrastructure will be born by the Developer.
 o. The following variances/waivers are being requested:

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 b. from Section 20-811(c) for sidewalks to installe streets. The original plat and street construction distruction distruction for side of Aldrich Street.

 1. Existing topography and proposed improvements show Topography contours and proposed improvements will documents.
- 10.
- 11.

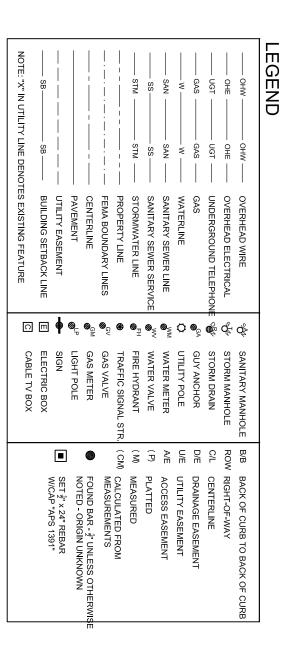
TTY OF LAWRENCE, DOUGLAS RE OR LESS.	FILING RECORD State of Kansas County of Douglas
	This is to certify that this instrument was filed for record in the office of the Douglas County Register of Deeds on this day of, 2012, and is duly recorded at AM/PM, in plat book,page
East Section Line for the SE 01°34'04"W). 30, Grand Addition. Further this Minor Subdivision/Replat is division, unless the action meets	
r aerial survey performed by uglas County 2006 and 2009, nformation for property & ded by All Points Surveying, July	
The Master Street Tree Plan filed <u>e</u> If street trees die, rees within one year. No trees ermission of the City of nt-of-way require tree root	Approved as a Minor Subdivision under Reviewed in accordance with the Subdivision Regulations of the City K.S.A. 58-2005 of Lawrence and the Unincorporated area of Douglas County.
is zoned RM-12D. All new ons of RM-12D zoned district as e.	Planning Director Date Michael D. Kelly, P.L.S. #869 Date Scott McCullough Douglas County Surveyor Rights-of-Way and Easements Accepted by City Commission
Minor Subdivision/Replat at the signated "Special Flood Hazard o Revised: August 5, 2010. E of "Special Flood Hazard Area" p Number: 20045C0167D, Map 6.0 shall be established for this	Lawrence, Kansas Robert J. Schumm Date Jonathan M. Douglass Date Mayor City Clerk
e existing right-of-way for ments are proposed. Public on/Replat consist of relocating sting Kasold Drive right-of-way. provide service to all lots. All all and sanitary sewer ted:	DEDICATION Be it known to all men that I (we), the undersigned owner(s) of the above described tract of land, have had cause for the same to be surveyed and platted as a Minor Subdivision under the name of "CRAND ADDITION No.2" and have caused the same to be subdivided into lot(s) and streets as shown and fully defined on this plat.
stalled on both sides of all on did not require streets on the shown for review purposes only. Is will be removed from final	Jerry Willis, Member Grand, LLC P.O. Box 3310 Lawrence, Kansas 66046
	ACKNOWLEDGEMENT State of Kansas County of Douglas Be it remembered that on this day of , 2012, before me, the
	of the same on behalf of Grand, LLC. In witness whereof, I have hereunto set my hand and affixed my seal on the day and year last written above.
	Notary Public My commission expires
	SURVEYOR'S CERTIFICATION I hereby certify that the platted area shown hereon is the true and accurate result of a field survey performed under my direct supervision in June, 2012, and that the plat is a closed traverse. This survey conforms to the Kansas Minimum Standards for Boundary Surveys.
	Steven D. Williams, P.L.S. #1391 P.O. Box 4444 Lawrence, KS 66046 (785)832-2121
W 27th Ter M 27th S DZC M 27th S Children	ENGINEER'S CERTIFICATION I hereby certify that the information and area map shown hereon are true and accurate to the best of my knowledge. Plat prepared August, 2012.
	John Dean Grob Professional Engineer #12769 P.O. Box 502 Lawrence, KS 66044 (785)856-1900
	GRAND ADDITION NO. 2, A MINOR SUBDIVISION/REPLAT OF LOT 1 & LOT 30, GRAND ADDITION a subdivision in the SE¼ of Section 10, Township 13 S, Range 19 E, in the City of Lawrence, Douglas County, Kansas





Prepared September 6, 2012





LEGAL DESCRIPTION LOT 1 & LOT 30, GRAND ADDITION, A SUBDIVISION IN THE CIT COUNTY, KANSAS. THE ABOVE CONTAINS 1.234 ACRES, MORE

- NOTES

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	ACKNOWLEDGEMENT State of Kansas County of Douglas Be it remembered that on this day of , 2012, before me, the undersigned, a notary public, in and for said county and state, came Jerry Willis,
	In witness whereof, I have hereunto set my hand and affixed my seal on the day and year last written above.
	ublic
	SURVEYOR'S CERTIFICATION I hereby certify that the platted area shown hereon is the true and accurate result of a field survey performed under my direct supervision in June, 2012, and that the plat is a closed traverse. This survey conforms to the Kansas Minimum Standards for Boundary Surveys.
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PLANNING COMMISSION REPORT Regular Agenda – Public Hearing Item

ITEM NO. 4A: I-4 and VC to UR-FP; 31.7 ACRES; NORTH OF K-10 BETWEEN GREENWAY CIRCLE & E 1575 ROAD (SMS)

Z-12-00119: Consider a request to rezone approximately 31.7 acres (and adjacent railroad ro-w) from I-4 (Heavy Industrial) and VC (Valley Channel) Districts to UR-FP (Urban Reserve – Floodplain Overlay) District, located in the NE1/4 & NW1/4 Sec 4-13-20 (Former Farmland Industries property, N of K-10 between Greenway Circle & E 1575 Rd). *Initiated by City Commission on 8/7/12.*

STAFF RECOMMENDATION: Staff recommends approval of the rezoning request for 31.7 acres from I-4 (Heavy Industrial) and VC (Valley Channel) to UR-FP (Urban Reserve-Floodplain Overlay) District and forwarding it to the City Commission with a recommendation for approval based on the findings of fact found in the body of the staff report.

Applicant's reason for request: Facilitate development of new business park.

KEY POINTS

- Sector plan identifies property as suitable for industrial development.
- The property has access to a planned arterial street (E 15th Street).
- Annexation of property requires designation of a suitable city zoning district.
- Chronology of planning efforts related to this property:
 - o 2001 -- Farmland Industries plant shut down due to bankruptcy
 - o 2005 -- Substantial field work completed under direction by KDHE
 - 2006 -- Site Characterization Report completed by Shaw Environmental, Inc with conclusion that a significant portion of site suitable for reuse in present state
 - 2007 -- City Commission initiated planning process for Farmland Industries Redevelopment Plan
 - o 2008 -- Governing Bodies adopted Farmland Industries Redevelopment Plan
 - o 2009 -- City annexed property
 - o 2009 City acquired property
 - 2009 -- Governing Bodies adopted updated Horizon 2020 Chapter 7 with locational criteria evaluating the site
 - o 2010 -- City awarded demolition contract for clean-up of site
 - o 2011 -- City Commission hired Bartlett & West/CDM Smith to develop Master Plan
 - o 2012 -- Informational meetings held in May with surrounding property owners
 - o 2012 -- Rezoning, Preliminary Plat & SUP applications submitted in July

ATTACHMENTS

- Area map.
- Proposed rezoning exhibit.

GOLDEN FACTORS TO CONSIDER

CHARACTER OF THE AREA

• The property is encumbered by the floodplain and used for agricultural fields.

CONFORMANCE WITH HORIZON 2020

• The proposed request is consistent with land use recommendations found in *Horizon 2020* and the *Farmland Industries Redevelopment Plan.*

ASSOCIATED CASES/OTHER ACTION REQUIRED

Items being considered at the September Planning Commission meeting:

- Rezoning request [Z-12-00120] approximately 170.4 acres (and adjacent railroad r-o-w) from I-4 (Heavy Industrial) District to UR (Urban Reserve) District, located in the NE1/4 & NW1/4 Sec 4-13-20.
- Rezoning request [Z-12-00121] approximately 170.7 acres (and adjacent highway r-o-w) from I-4 (Heavy Industrial), I-1 (Limited Industrial), A (Agricultural) County Districts and CC200 (Community Commercial Center) City District to IG (General Industrial) District, located in the NW1/4 & SW1/4 Sec 4-13-20.
- Rezoning request [Z-12-00122] approximately 59.0 acres (and adjacent highway r-o-w) from I-1 (Limited Industrial), B-1 (Neighborhood Business); A (Agricultural) [County Districts] and IG (General Industrial) District to IM (Medium Industrial) District, located in the SE1/4 Sec 5-13-20 & SW1/4 Sec 4-13-20.
- Preliminary Plat of the former Farmland Industries property [PP-12-00101]
- Special Use Permit [SUP-12-00100] for relocation and construction of a Westar substation to provide electricity to the Former Farmland Industries property and surrounding properties.

Other action required:

- City Commission approval of rezoning requests and adoption of ordinances.
- City Commission approval of the Special Use Permit and adoption of ordinance.
- Publication of rezoning and Special Use Permit ordinances.
- Submittal of Final Plat for administrative approval and recordation.
- City Commission acceptance of dedication of easements and rights-of-way for the Final Plat.
- Release of Special Use Permit site plan to Development Services for Building Permits.
- Submission and approval of administrative site plans for individual lot development within the business park.

PUBLIC COMMENT RECEIVED PRIOR TO PRINTING

No public comment was received prior to publication of this staff report.

Project Summary:

This property includes approximately 32 acres. The property has approximately 2,600 feet of frontage along N 1500 Road. The southwesterly edge of the property abuts the BNSF railroad right-of-way for approximately 2,900 feet. The northwestern portion of this tract is encumbered by the regulatory floodplain and the northeastern portion includes high quality agricultural soils. The proposed request is for rezoning the property to the UR-FP (Urban Reserve-Floodplain Overlay) District.

1. CONFORMANCE WITH THE COMPREHENSIVE PLAN

The Comprehensive Plan recognizes the need to identify an adequate amount of available land in Douglas County to meet diverse industrial and business related development needs. *Chapter* 7 – *Industrial & Employment-Related Land Use (Policy 2.1)*, identifies general locational criteria for industrial developments which include:

- feasible access to Federal and State transportation networks;
- adequate parcel size, generally over forty acres;
- lie primarily outside of the regulatory floodplain; and
- have minimal average slopes.

The Plan identifies this site as meeting these general criteria.

The proposed zoning provides to Urban Reserve-Floodplain Overlay provides a 'holding zone' for property to avoid premature development. The property provides for the planned expansion of the business park as laid out in the Preliminary Plat.

The community's need to identify land for future business parks is again stated in *Chapter 12 – Economic Development, Policy 6: Business Infrastructure, Priority 6.1: Business Park Development.* The chapter states "Douglas County must identify land for future business and corporate business parks that takes advantage of the airport, the interstate/highway system, and the westward growth of Johnson County. Within the next few years, the City and County Commissions shall identify and designate at least 1000 acres of land for industrial expansion over the next 25 years. The commissions shall also put in motion the capitalization and infrastructure development needed to bring those 1000 acres into productive use."

The *Farmland Industries Redevelopment Plan* brings together the community goals of creating additional employment and open space by providing a plan to redevelop a brownfield into a major community asset. The plan indicated this portion of the property would be suitable for general industrial uses and ultimately provides for potential access to E 19th Street and possibly to E 15th Street.

Staff Finding -- The proposed rezoning is in conformance with the recommendations in *Horizon 2020* and the *Farmland Industries Redevelopment Plan*.

2. ZONING AND USE OF NEARBY PROPERTY, INCLUDING OVERLAY ZONING

Current Zoning and Land Use:	I-4 (Heavy Industrial) and VC (Valley Channel) Districts; agricultural fields.
Surrounding Zoning and Land Use:	To the north: I-3 (Heavy Industrial) and VC (Valley Channel) Districts; agricultural fields.
	To the south and west: I-4 (Heavy Industrial) District; majority vacant (northern portion of former Farmland Industries property) with bag house, bulk warehouses, above-ground storage tanks and remediation ponds.

To the east:

VC (Valley Channel) District; agricultural fields.

Staff Finding -- The surrounding property is predominantly county industrial zoned and used for agricultural fields. Much of the property to the north and east is encumbered by the floodplain. A portion of the parcel also includes Class I soils. The property is bounded on the southwest by the BNSF railroad tracks. The remediation ponds and remaining Farmland structures are located across the tracks.

3. CHARACTER OF THE NEIGHBORHOOD

Staff Finding -- This area has historically been used as agricultural fields due to the proximity of the floodplain. The property to the south was utilized as part of the fertilizer plant since 1954. The City developed around the former Farmland Industries property with the island annexation of East Hills in the mid-1980s. This area has been anticipated as a natural expansion of industrial park sites for many years.

4. PLANS FOR THE AREA OR NEIGHBORHOOD, AS REFLECTED IN ADOPTED AREA AND/OR SECTOR PLANS INCLUDING THE PROPERTY OR ADJOINING PROPERTY

Staff Finding – This property was studied in detail through the development of the *Farmland Industries Redevelopment Plan.* The plan brings together the community goals of creating additional employment and open space by providing a plan to redevelop a brownfield into a major community asset. The plan indicated this portion of the property would be suitable for general industrial uses and ultimately provides for potential access to E 19th Street and possibly to E 15th Street.

5. SUITABILITY OF SUBJECT PROPERTY FOR THE USES TO WHICH IT HAS BEEN RESTRICTED UNDER THE EXISTING ZONING REGULATIONS

The request is to rezone the property to the UR-FP District. Since the property has been annexed into the city, the county zoning designations are no longer appropriate. The property is adjacent to a boundary line road, E 1500 Road (future E 15th Street) and continues to be used for agricultural fields. *Crop Agriculture* is a use that is permitted in most City zoning districts. It is anticipated for future uses, but is not intended for immediate development.

This property is encumbered by the regulatory floodplain. Section 20-1201(c) of the Development Code requires the additional zoning designation of FP Overlay District. The FP (Floodplain Management Regulations Overlay) District is an appropriate zoning district for property encumbered with the floodplain.

The property is within the boundary of the *Farmland Industries Redevelopment Plan* and within an area designated for future industrial development.

Staff Finding -- The current county zoning designations are no longer appropriate since the property has been annexed into the city. Rezoning to the Urban Reserve-Floodplain Overlay District provides an appropriate city zoning district while the property to the south continues to undergo clean-up and remediation.

6. LENGTH OF TIME SUBJECT PROPERTY HAS REMAINED VACANT AS ZONED

Staff Finding – The property is currently undeveloped and used as agricultural fields. The county industrial zoning designation has been in place since 1966 when the County adopted zoning regulations. The Valley Channel designation preceded the County's FEMA floodplain designations.

7. EXTENT TO WHICH APPROVING THE REZONING WILL DETRIMENTALLY AFFECT NEARBY PROPERTIES

Staff Finding – The property was annexed in July 2009 and the County District is no longer appropriate. A portion of the property is located in the regulatory floodplain and therefore, rezoning to the Floodplain Overlay District is required. The property is not proposed for immediate development. Rezoning to the UR District provides a 'holding zone' for property to avoid premature development.

The only principal uses allowed in the UR District are *Crop Agriculture* and any lawful use in existence immediately prior to annexation. The City's Floodplain Management Regulations control property in the FP Overlay District. The property must be rezoned to a City of Lawrence zoning district following annexation. This portion of the property will need to be rezoned to a different City District prior to any development. Rezoning to the UR-FP District will not detrimentally affect nearby properties.

8. THE GAIN, IF ANY, TO THE PUBLIC HEALTH, SAFETY AND WELFARE DUE TO THE DENIAL OF THE APPLICATION, AS COMPARED TO THE HARDSHIP IMPOSED UPON THE LANDOWNER, IF ANY, AS A RESULT OF DENIAL OF THE APPLICATION

Evaluation of this criterion includes weighing the benefits the denial of the rezoning request would provide for the public versus the hardship the denial would impose on the owner of the subject property. Benefits are measured based on the anticipated impacts of the rezoning request on the public health, safety and welfare.

Staff Finding – If the rezoning request were denied, the area would remain a mix of zoning districts and could not be developed for future expansion of the community's tax base. Approval of the request provides the opportunity to develop a coordinated business park supporting the general industrial uses planned for the majority of the park. The gain to the public is the potential addition of a substantial number of acres of industrial property following additional remediation efforts and future improvements to E 15th Street.

9. PROFESSIONAL STAFF RECOMMENDATION

Section 20-223(a) identifies the purpose of the UR District as follows:

The UR, Urban Reserve District, is a Special Purpose Base District primarily intended to provide a suitable classification for newly annexed land. The District is intended to avoid premature or inappropriate development that is not well served by infrastructure or community services. It is also intended for implementation in areas where an adopted neighborhood plan or area development plan is not in place. It permits only very low-intensity development until such time that a land use plan and infrastructure and community services are in place.

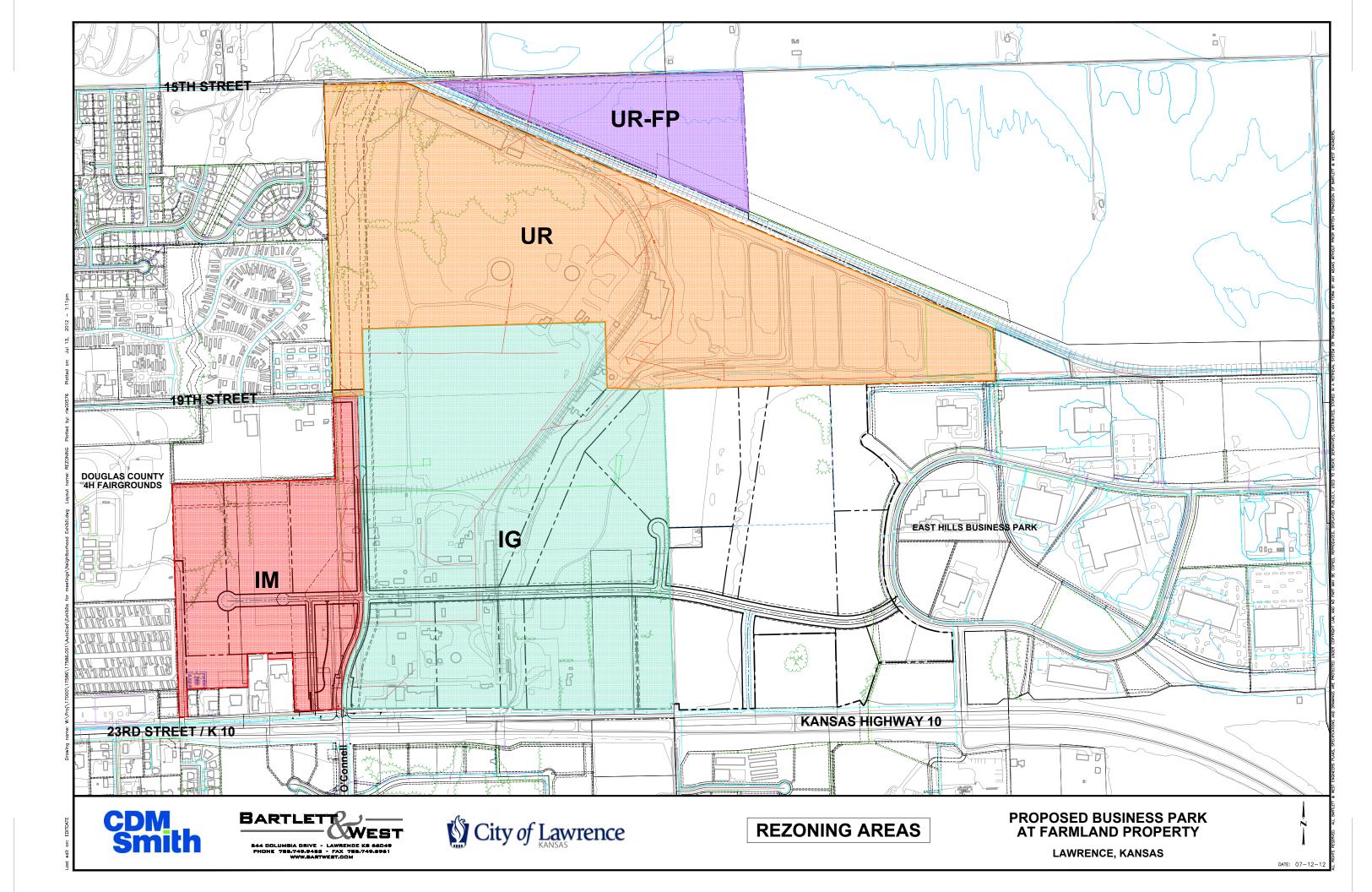
Section 20-303 states that

The FP, Floodplain Management Regulations are implemented as an Overlay District.

This property is not adjacent to an improved city street, is encumbered by the regulatory floodplain and contains high quality agricultural soils. It is not currently suitable for new development, but may continue to be used for agricultural uses in the interim. The UR District provides a 'holding zone' until such time this property is ready for development. The FP Overlay District is mandated when properties encumbered by the floodplain are annexed into the City.

Rezoning to another City district will be necessary before any new industrial uses may be developed in this part of the park. If this request is approved, additional development standards including final platting, site planning, and compliance with applicable design guidelines will be considered with future development applications.

This staff report reviews the proposed location for its compliance with the Comprehensive Plan, the Golden Factors, and compatibility with surrounding development. The development proposal meets the locational criteria required for approval. The rezoning request is compliant with recommendations in *Horizon 2020* and *Farmland Industries Redevelopment Plan*. Staff recommends approval of the rezoning request for 31.7 acres from I-4 (Heavy Industrial) and VC (Valley Channel) to UR-FP (Urban Reserve-Floodplain Overlay) District and forwarding it to the City Commission with a recommendation for approval based on the findings of fact found in the body of the staff report.



PLANNING COMMISSION REPORT Regular Agenda – Public Hearing Item

ITEM NO. 4B: I-4 to UR; 170.4 ACRES; NORTH OF K-10 BETWEEN GREENWAY CIRCLE & E 1575 ROAD (SMS)

Z-12-00120: Consider a request to rezone approximately 170.4 acres (and adjacent railroad ro-w) from I-4 (Heavy Industrial) District to UR (Urban Reserve) District, located in the NE1/4 & NW1/4 Sec 4-13-20 (Former Farmland Industries property, N of K-10 between Greenway Circle & E 1575 Rd). *Initiated by City Commission on 8/7/12.*

STAFF RECOMMENDATION: Staff recommends approval of the rezoning request for 170.4 acres from I-4 (Heavy Industrial) to UR (Urban Reserve) District and forwarding it to the City Commission with a recommendation for approval based on the findings of fact found in the body of the staff report.

Applicant's reason for request: Facilitate development of new business park.

KEY POINTS

- Sector plan identifies property as suitable for industrial development.
- The property has access to a planned arterial street (E 15th Street) and close proximity to the planned intersection for the completed K-10 by-pass.
- Annexation of property requires designation of a suitable city zoning district.
- Chronology of planning efforts related to this property:
 - o 2001 -- Farmland Industries plant shut down due to bankruptcy
 - o 2005 -- Substantial field work completed under direction by KDHE
 - 2006 -- Site Characterization Report completed by Shaw Environmental, Inc with conclusion that a significant portion of site suitable for reuse in present state
 - 2007 -- City Commission initiated planning process for Farmland Industries Redevelopment Plan
 - o 2008 -- Governing Bodies adopted Farmland Industries Redevelopment Plan
 - o 2009 -- City annexed property
 - o 2009 City acquired property
 - O 2009 -- Governing Bodies adopted updated Horizon 2020 Chapter 7 with locational criteria evaluating the site
 - o 2010 -- City awarded demolition contract for clean-up of site
 - o 2011 -- City Commission hired Bartlett & West/CDM Smith to develop Master Plan
 - o 2012 -- Informational meetings held in May with surrounding property owners
 - o 2012 -- Rezoning, Preliminary Plat & SUP applications submitted in July

ATTACHMENTS

- Area map.
- Proposed rezoning exhibit.

GOLDEN FACTORS TO CONSIDER

CHARACTER OF THE AREA

- The property includes existing structures (bag house, bulk warehouses and aboveground storage tanks) and the remediation ponds.
- A portion of the property to the north remains outside the city limits.

CONFORMANCE WITH HORIZON 2020

• The proposed request is consistent with land use recommendations found in *Horizon 2020* and the *Farmland Industries Redevelopment Plan.*

ASSOCIATED CASES/OTHER ACTION REQUIRED

Items being considered at the September Planning Commission meeting:

- Rezoning request [Z-12-00119] approximately 31.7 acres (and adjacent railroad r-o-w) from I-4 (Heavy Industrial) and VC (Valley Channel) Districts to UR-FP (Urban Reserve Floodplain Overlay) District, located in the NE1/4 & NW1/4 Sec 4-13-20.
- Rezoning request [Z-12-00121] approximately 170.7 acres (and adjacent highway r-o-w) from I-4 (Heavy Industrial), I-1 (Limited Industrial), A (Agricultural) County Districts and CC200 (Community Commercial Center) City District to IG (General Industrial) District, located in the NW1/4 & SW1/4 Sec 4-13-20.
- Rezoning request [Z-12-00122] approximately 59.0 acres (and adjacent highway r-o-w) from I-1 (Limited Industrial), B-1 (Neighborhood Business); A (Agricultural) [County Districts] and IG (General Industrial) District to IM (Medium Industrial) District, located in the SE1/4 Sec 5-13-20 & SW1/4 Sec 4-13-20.
- Preliminary Plat of the former Farmland Industries property [PP-12-00101]
- Special Use Permit [SUP-12-00100] for relocation and construction of a Westar substation to provide electricity to the Former Farmland Industries property and surrounding properties.

Other action required:

- City Commission approval of rezoning requests and adoption of ordinances.
- City Commission approval of the Special Use Permit and adoption of ordinance.
- Publication of rezoning and Special Use Permit ordinances.
- Submittal of Final Plat for administrative approval and recordation.
- City Commission acceptance of dedication of easements and rights-of-way for the Final Plat.
- Release of Special Use Permit site plan to Development Services for Building Permits.
- Submission and approval of administrative site plans for individual lot development within the business park.

PUBLIC COMMENT RECEIVED PRIOR TO PRINTING

No public comment was received prior to publication of this staff report.

Project Summary:

This property includes approximately 170 acres. The property has approximately 650 feet of frontage along N1500 Road. The northeasterly edge of the property abuts the BNSF railroad right-of-way for approximately 5,000 feet. The proposed proposes to rezone the property to the UR (Urban Reserve) District.

1. CONFORMANCE WITH THE COMPREHENSIVE PLAN

The Comprehensive Plan recognizes the need to identify an adequate amount of available land in Douglas County to meet diverse industrial and business related development needs. *Chapter* 7 – *Industrial & Employment-Related Land Use (Policy 2.1)*, identifies general locational criteria for industrial developments which include:

- feasible access to Federal and State transportation networks;
- adequate parcel size, generally over forty acres;
- lie primarily outside of the regulatory floodplain; and
- have minimal average slopes.

The Plan identifies this site as meeting these general criteria.

The proposed zoning provides to Urban Reserve provides a 'holding zone' for the future industrial property while remediation efforts continue. The property provides for the planned expansion of the business park as laid out in the Preliminary Plat.

The community's need to identify land for future business parks is again stated in *Chapter 12 – Economic Development, Policy 6: Business Infrastructure, Priority 6.1: Business Park Development.* The chapter states "Douglas County must identify land for future business and corporate business parks that takes advantage of the airport, the interstate/highway system, and the westward growth of Johnson County. Within the next few years, the City and County Commissions shall identify and designate at least 1000 acres of land for industrial expansion over the next 25 years. The commissions shall also put in motion the capitalization and infrastructure development needed to bring those 1000 acres into productive use."

The *Farmland Industries Redevelopment Plan* brings together the community goals of creating additional employment and open space by providing a plan to redevelop a brownfield into a major community asset. The plan indicated this portion of the property would be suitable for general industrial uses and ultimately provides for potential access to E 19th Street and possibly to E 15th Street.

Staff Finding -- The proposed rezoning is in conformance with the recommendations in *Horizon 2020* and the *Farmland Industries Redevelopment Plan*.

2. ZONING AND USE OF NEARBY PROPERTY, INCLUDING OVERLAY ZONING

Current Zoning and Land Use:	I-4 (Heavy Industrial) District; majority vacant (northern portion of former Farmland Industries property) with bag house, bulk warehouses, above-ground storage tanks and remediation ponds.
Surrounding Zoning and Land Use:	To the north: I-3 (Heavy Industrial) District north of N 1500 Road and I- 4 (Heavy Industrial) District across railroad r/w; agricultural fields.

To the south:

I-4 (Heavy Industrial) District and IG (General Industrial) District; portion of former Farmland Industries property, undeveloped County owned property and portions of East Hills Business Park.

To the east: RS7 and RS10 (Single-Dwelling Residential) Districts; existing mobile home park, single-family homes and undeveloped property. To the west: OS-FP (Open Space – Floodplain Overlay) District; Cityowned parcel containing Pump Station No. 25.

Staff Finding – The surrounding property is a mix of city and county zoned property. The majority of the area is county industrial property that is the former Farmland Industries property to the south. The property to the north is zoned county industrial and used as agricultural fields. Much of the property to the north is also encumbered by floodplain. Properties to the west include a residentially zoned mobile home park and single-family subdivision. The east side of the property is bounded by the BNSF railroad tracks and additional property that is part of this development package.

3. CHARACTER OF THE NEIGHBORHOOD

Staff Finding -- This area is located between the eastern city limits and the East Hills Business Park along K-10 highway. It had been used as a portion of the fertilizer plant for more than 50 years. The City developed around the former Farmland Industries property with the island annexation of East Hills in the mid-1980s. This area has been anticipated as a natural expansion of industrial park sites for many years.

4. PLANS FOR THE AREA OR NEIGHBORHOOD, AS REFLECTED IN ADOPTED AREA AND/OR SECTOR PLANS INCLUDING THE PROPERTY OR ADJOINING PROPERTY

Staff Finding – This property was studied in detail through the development of the *Farmland Industries Redevelopment Plan.* The plan brings together the community goals of creating additional employment and open space by providing a plan to redevelop a brownfield into a major community asset. The plan indicated this portion of the property would be suitable for general industrial uses and ultimately provides for potential access to E 19th Street and possibly to E 15th Street.

5. SUITABILITY OF SUBJECT PROPERTY FOR THE USES TO WHICH IT HAS BEEN RESTRICTED UNDER THE EXISTING ZONING REGULATIONS

The request is to rezone the property to the UR District. Since the property has been annexed into the city, the county zoning designations are no longer appropriate. Due to the continuing remediation efforts, the ponds will be in use for a number of years into the future and this portion of the site is anticipated for future, rather than immediate, development. Therefore, the UR District is appropriate.

The property is within the boundary of the *Farmland Industries Redevelopment Plan* and within an area designated for future industrial development.

Staff Finding – The current county zoning designations are no longer appropriate since the property has been annexed into the city. Rezoning to the Urban Reserve District provides an appropriate city zoning district while the property continues to undergo clean-up and remediation.

6. LENGTH OF TIME SUBJECT PROPERTY HAS REMAINED VACANT AS ZONED

Staff Finding – The property was developed in the 1950s as a fertilizer plant and remained in operation until 2001. In 2011, the City made extensive progress in demolishing multiple structures; however some of the plant structures remain and will be removed with development of the future business park. The bag house, two above ground storage tanks and two bulk warehouses remain as well as the seven remediation ponds. The county zoning designations have been in place since 1966 when the County adopted zoning regulations.

7. EXTENT TO WHICH APPROVING THE REZONING WILL DETRIMENTALLY AFFECT NEARBY PROPERTIES

Staff Finding – The property was annexed in July 2009 and the County District is no longer appropriate. This parcel represents the majority of the northern part of the site. It is not proposed for immediate development and includes seven remediation ponds. Rezoning to the UR District provides a 'holding zone' for property to avoid premature development. The property must be rezoned to a City of Lawrence zoning district following annexation.

The only principal uses allowed in the UR District are *Crop Agriculture* and any lawful use in existence immediately prior to annexation. The part of the property is internal to the entire site and will likely continue to be used for storage activities while environmental remediation efforts progress. This portion of the property will need to be rezoned to a different City District prior to any development. Rezoning to the UR District will not detrimentally affect nearby properties.

8. THE GAIN, IF ANY, TO THE PUBLIC HEALTH, SAFETY AND WELFARE DUE TO THE DENIAL OF THE APPLICATION, AS COMPARED TO THE HARDSHIP IMPOSED UPON THE LANDOWNER, IF ANY, AS A RESULT OF DENIAL OF THE APPLICATION

Evaluation of this criterion includes weighing the benefits the denial of the rezoning request would provide for the public versus the hardship the denial would impose on the owner of the subject property. Benefits are measured based on the anticipated impacts of the rezoning request on the public health, safety and welfare.

Staff Finding – If the rezoning request were denied, the area would remain a mix of zoning districts and could not be developed for future expansion of the community's tax base. Approval of the request provides the opportunity to develop a coordinated business park supporting the general industrial uses planned for the majority of the park. The gain to the public is the potential addition of a substantial number of acres of industrial property following additional remediation efforts.

9. PROFESSIONAL STAFF RECOMMENDATION

Section 20-223(a) identifies the purpose of the UR District as follows:

The UR, Urban Reserve District, is a Special Purpose Base District primarily intended to provide a suitable classification for newly annexed land. The District is intended to avoid premature or inappropriate development that is not well served by infrastructure or community services. It is also intended for implementation in areas where an adopted neighborhood plan or area development plan is not in place. It permits only very low-intensity development until such time that a land use plan and infrastructure and community services are in place.

This part of the former Farmland Industries property still contains structures such as the bag house, bulk warehouses and aboveground storage tanks as well as the seven ponds that are utilized in the on-going remediation efforts. This property is not currently suitable for new development, but may be used for storage purposes in the interim. The UR District provides a 'holding zone' until such time this property is ready for development. Rezoning to another City district will be necessary before any new industrial uses may be developed in this part of the park. If this request is approved, additional development standards including final platting, site planning, and compliance with applicable design guidelines will be considered with future development applications.

This staff report reviews the proposed location for its compliance with the Comprehensive Plan, the Golden Factors, and compatibility with surrounding development. The development proposal meets the locational criteria required for approval. The rezoning request is compliant with recommendations in *Horizon 2020* and *Farmland Industries Redevelopment Plan*. Staff recommends approval of the rezoning request for 170.4 acres from I-4 (Heavy Industrial) to UR (Urban Reserve) District and forwarding it to the City Commission with a recommendation for approval based on the findings of fact found in the body of the staff report.

PLANNING COMMISSION REPORT Regular Agenda – Public Hearing Item

ITEM NO. 4C: I-4, I-1, A and CC-200 to IG; 170.7 ACRES; NORTH OF K-10 BETWEEN GREENWAY CIRCLE & E 1575 ROAD (SMS)

Z-12-00121: Consider a request to rezone approximately 170.7 acres (and adjacent highway r-o-w) from I-4 (Heavy Industrial), I-1 (Limited Industrial), A (Agricultural) [County] Districts and CC200 (Community Commercial Center) [City] District to IG (General Industrial) District, located in the NW1/4 & SW1/4 Sec 4-13-20 (Former Farmland Industries property, N of K-10 between Greenway Circle & E 1575 Rd). *Initiated by City Commission on 8/7/12.*

STAFF RECOMMENDATION: Staff recommends approval of the rezoning request for 170.7 acres from I-4 (Heavy Industrial), I-1 (Limited Industrial), A (Agricultural) and CC-200 (Community Commercial) to IG (General Industrial) District and forwarding it to the City Commission with a recommendation for approval based on the findings of fact found in the body of the staff report.

Applicant's reason for request: Facilitate development of new business park.

KEY POINTS

- Sector plan identifies property as suitable for industrial development.
- The property has immediate access to an improved arterial street and close proximity to the planned intersection for the completed K-10 by-pass.
- Annexation of property requires designation of a suitable city zoning district.
- Chronology of planning efforts related to this property:
 - o 2001 -- Farmland Industries plant shut down due to bankruptcy
 - o 2005 -- Substantial field work completed under direction by KDHE
 - 2006 -- Site Characterization Report completed by Shaw Environmental, Inc with conclusion that a significant portion of site suitable for reuse in present state
 - 2007 -- City Commission initiated planning process for Farmland Industries Redevelopment Plan
 - o 2008 -- Governing Bodies adopted Farmland Industries Redevelopment Plan
 - o 2009 -- City annexed property
 - o 2009 City acquired property
 - O 2009 -- Governing Bodies adopted updated Horizon 2020 Chapter 7 with locational criteria evaluating the site
 - o 2010 -- City awarded demolition contract for clean-up of site
 - o 2011 -- City Commission hired Bartlett & West/CDM Smith to develop Master Plan
 - o 2012 -- Informational meetings held in May with surrounding property owners
 - o 2012 -- Rezoning, Preliminary Plat & SUP applications submitted in July

ATTACHMENTS

- Area map.
- Proposed rezoning exhibit.

GOLDEN FACTORS TO CONSIDER

CHARACTER OF THE AREA

- Property contains a portion of the Westar electrical substation and the majority of the former Farmland Industries industrial plant.
- Includes undeveloped County owned property located between the former plant and the developing East Hills Business Park.

CONFORMANCE WITH HORIZON 2020

• The proposed request is consistent with land use recommendations found in *Horizon 2020* and the *Farmland Industries Redevelopment Plan*.

ASSOCIATED CASES/OTHER ACTION REQUIRED

Items being considered at the September Planning Commission meeting:

- Rezoning request [Z-12-00119] approximately 31.7 acres (and adjacent railroad r-o-w) from I-4 (Heavy Industrial) and VC (Valley Channel) Districts to UR-FP (Urban Reserve Floodplain Overlay) District, located in the NE1/4 & NW1/4 Sec 4-13-20.
- Rezoning request [Z-12-00120] approximately 170.4 acres (and adjacent railroad r-o-w) from I-4 (Heavy Industrial) District to UR (Urban Reserve) District, located in the NE1/4 & NW1/4 Sec 4-13-20.
- Rezoning request [Z-12-00122] approximately 59.0 acres (and adjacent highway r-o-w) from I-1 (Limited Industrial), B-1 (Neighborhood Business); A (Agricultural) [County Districts] and IG (General Industrial) District to IM (Medium Industrial) District, located in the SE1/4 Sec 5-13-20 & SW1/4 Sec 4-13-20.
- Preliminary Plat of the former Farmland Industries property [PP-12-00101]
- Special Use Permit [SUP-12-00100] for relocation and construction of a Westar substation to provide electricity to the Former Farmland Industries property and surrounding properties.

Other action required:

- City Commission approval of rezoning requests and adoption of ordinances.
- City Commission approval of the Special Use Permit and adoption of ordinance.
- Publication of rezoning and Special Use Permit ordinances.
- Submittal of Final Plat for administrative approval and recordation.
- City Commission acceptance of dedication of easements and rights-of-way for the Final Plat.
- Release of Special Use Permit site plan to Development Services for Building Permits.
- Submission and approval of administrative site plans for individual lot development within the business park.

PUBLIC COMMENT RECEIVED PRIOR TO PRINTING

No public comment was received prior to publication of this staff report.

Project Summary:

This property includes approximately 170 acres. The property has approximately 2693 feet of frontage along K-10/E 23^{rd} Street. The request proposes to rezone the property to the IG (General Industrial) District.

1. CONFORMANCE WITH THE COMPREHENSIVE PLAN

The Comprehensive Plan recognizes the need to identify an adequate amount of available land in Douglas County to meet diverse industrial and business related development needs. *Chapter* 7 – *Industrial & Employment-Related Land Use (Policy 2.1)*, identifies general locational criteria for industrial developments which include:

- feasible access to Federal and State transportation networks;
- adequate parcel size, generally over forty acres;
- lie primarily outside of the regulatory floodplain; and
- have minimal average slopes.

The Plan identifies this site as meeting these general criteria.

The proposed zoning provides for a range of uses in the proposed IG District to support new business and industrial development for the community.

The community's need to identify land for future business parks is again stated in *Chapter 12 – Economic Development, Policy 6: Business Infrastructure, Priority 6.1: Business Park Development.* The chapter states "Douglas County must identify land for future business and corporate business parks that takes advantage of the airport, the interstate/highway system, and the westward growth of Johnson County. Within the next few years, the City and County Commissions shall identify and designate at least 1000 acres of land for industrial expansion over the next 25 years. The commissions shall also put in motion the capitalization and infrastructure development needed to bring those 1000 acres into productive use."

The *Farmland Industries Redevelopment Plan* brings together the community goals of creating additional employment and open space by providing a plan to redevelop a brownfield into a major community asset. The plan indicated this portion of the property would be suitable for general industrial uses and provides for highway visibility and access.

Staff Finding -- The proposed rezoning is in conformance with the recommendations in *Horizon 2020* and the *Farmland Industries Redevelopment Plan*.

2. ZONING AND USE OF NEARBY PROPERTY, INCLUDING OVERLAY ZONING

Current Zoning and Land Use: I-4 (Heavy Industrial), I-1 (Limited Industrial), A (Agricultural) [County] Districts and CC200 (Community Commercial Center) [City] District; former Farmland Industries lab building, portion of Westar electrical substation (to be relocated to the north) and vacant (southern and central portions of former Farmland Industries property). [The CC-200 portion is K-10 rightof-way zoned with the Fairfield Farms development.]

Surrounding Zoning and Land Use: To the north: I-4 (Heavy Industrial) District; majority vacant (northern portion of former Farmland Industries property) with bag house, bulk warehouses and above-ground storage tanks.

> To the south: CC200 (Community Commercial) and IL (Light Industrial) [City] Districts and I-1 (Limited Industrial) [County] District; majority undeveloped and existing Tractor Supply store.

To the east:

I-4 (Heavy Industrial) District proposed to be rezoned to IM (Medium Industrial) and UR (Urban Reserve) Districts; vacant (eastern portion of former Farmland Industries property) proposed for north-south street connection to 19th Street and utility corridor.

To the west:

IG (General Industrial) District; majority undeveloped property between former Farmland Industries and East Hills Business Park and AT&T cell tower (property included in the related Preliminary Plat).

Staff Finding -- The surrounding property is a mix of city and county zoned property. The majority of the area is county industrial property that is the former Farmland Industries property to the north and west. The properties to the east include the undeveloped County owned property (included in the Preliminary Plat) and the developing lots within the East Hills Business Park. The properties to the south are undeveloped multi-family and commercially zoned properties along the highway frontage road. Developed properties in the Mt. Blue PID are also located to the southeast.

3. CHARACTER OF THE NEIGHBORHOOD

Staff Finding -- This area is located between the eastern city limits and the East Hills Business Park along K-10 highway. It had been used as a portion of the fertilizer plant for more than 50 years. The City developed around the former Farmland Industries property with the island annexation of East Hills in the mid-1980s. This area has been anticipated as a natural expansion of industrial park sites for many years.

4. PLANS FOR THE AREA OR NEIGHBORHOOD, AS REFLECTED IN ADOPTED AREA AND/OR SECTOR PLANS INCLUDING THE PROPERTY OR ADJOINING PROPERTY

Staff Finding – This property was studied in detail through the development of the *Farmland Industries Redevelopment Plan.* The plan brings together the community goals of creating additional employment and open space by providing a plan to redevelop a brownfield into a major community asset. The plan indicated this portion of the property would be suitable for general industrial uses and provides for highway visibility and access.

5. SUITABILITY OF SUBJECT PROPERTY FOR THE USES TO WHICH IT HAS BEEN RESTRICTED UNDER THE EXISTING ZONING REGULATIONS

The request is to rezone the property to the IG District. Since the property has been annexed into the city, the county zoning designations are no longer appropriate. The property is within the boundary of the *Farmland Industries Redevelopment Plan* and within an area designated for future industrial development.

Staff Finding – The current county zoning designations are no longer appropriate since the property has been annexed into the city. Rezoning to the General Industrial District provides substantial acreage to be developed and marketed for job growth in the community.

6. LENGTH OF TIME SUBJECT PROPERTY HAS REMAINED VACANT AS ZONED

Staff Finding – The property was developed in the 1950s as a fertilizer plant and remained in operation until 2001. In 2011, the City made extensive progress in demolishing multiple structures; however some of the plant structures remain and will be removed with development of the future business park. The county zoning designations have been in place since 1966 when the County adopted zoning regulations.

7. EXTENT TO WHICH APPROVING THE REZONING WILL DETRIMENTALLY AFFECT NEARBY PROPERTIES

Staff Finding – The property was annexed in July 2009 and the County Districts are no longer appropriate. The property must be rezoned to a City of Lawrence zoning district prior to development. Rezoning to the IG District provides substantial acreage to be developed and

marketed for job growth in the community. Approval of the request is not anticipated to detrimentally affect nearby properties.

8. THE GAIN, IF ANY, TO THE PUBLIC HEALTH, SAFETY AND WELFARE DUE TO THE DENIAL OF THE APPLICATION, AS COMPARED TO THE HARDSHIP IMPOSED UPON THE LANDOWNER, IF ANY, AS A RESULT OF DENIAL OF THE APPLICATION

Evaluation of this criterion includes weighing the benefits the denial of the rezoning request would provide for the public versus the hardship the denial would impose on the owner of the subject property. Benefits are measured based on the anticipated impacts of the rezoning request on the public health, safety and welfare.

Staff Finding – If the rezoning request were denied, the area would remain a mix of zoning districts and could not be developed for future expansion of the community's tax base. Approval of the request provides the opportunity to develop a coordinated business park supporting the general industrial uses planned for the majority of the park. The gain to the public is the addition of a substantial number of acres of industrial property and the ability to offer new sites for potential job growth in the community.

9. PROFESSIONAL STAFF RECOMMENDATION

Section 20-217(a) identifies the purpose of the IG District as follows:

The IG, General Industrial District, is primarily intended to accommodate moderate- and high-impact industrial uses, including large scale or specialized industrial operations requiring good transportation access and public facilities and services. The District is generally incompatible with residential areas and low-intensity commercial areas.

This portion of the former Farmland Industries property is well suited to these uses with its highway frontage and location abutting existing IG zoned property to the east. If this request is approved, additional development standards including final platting, site planning, and compliance with applicable design guidelines will be considered with future development applications.

This staff report reviews the proposed location for its compliance with the Comprehensive Plan, the Golden Factors, and compatibility with surrounding development. The development proposal meets the locational criteria required for approval. The rezoning request is compliant with recommendations in *Horizon 2020* and *Farmland Industries Redevelopment Plan*. Staff recommends approval of the rezoning request for 170.7 acres from I-4 (Heavy Industrial), I-1 (Limited Industrial), A (Agricultural) and CC-200 (Community Commercial) to IG (General Industrial) District and forwarding it to the City Commission with a recommendation for approval based on the findings of fact found in the body of the staff report.

PLANNING COMMISSION REPORT Regular Agenda – Public Hearing Item

ITEM NO. 4D: I-1, B-1, A & IG to IM; 59.0 ACRES; NORTH OF K-10 BETWEEN GREENWAY CIRCLE & E 1575 ROAD (SMS)

Z-12-00122: Consider a request to rezone approximately 59.0 acres (and adjacent highway ro-w) from I-1 (Limited Industrial), B-1 (Neighborhood Business); A (Agricultural) [County Districts] and IG (General Industrial) District to IM (Medium Industrial) District, located in the SE1/4 Sec 5-13-20 & SW1/4 Sec 4-13-20 (Former Farmland Industries property, N of K-10 between Greenway Circle & E 1575 Rd). *Initiated by City Commission on 8/7/12.*

STAFF RECOMMENDATION: Staff recommends approval of the rezoning request for 59.0 acres from I-1 (Limited Industrial), B-1 (Neighborhood Business), A (Agricultural) and IG (General Industrial) to IM (Medium Industrial) District and forwarding it to the City Commission with a recommendation for approval based on the findings of fact found in the body of the staff report.

Applicant's reason for request: Facilitate development of new business park.

KEY POINTS

- Sector plan identifies property as suitable for industrial development.
- The property has immediate access to an improved arterial street and close proximity to the planned intersection for the completed K-10 by-pass.
- Annexation of property requires designation of a suitable city zoning district.
- Chronology of planning efforts related to this property:
 - o 2001 -- Farmland Industries plant shut down due to bankruptcy
 - o 2005 -- Substantial field work completed under direction by KDHE
 - 2006 -- Site Characterization Report completed by Shaw Environmental, Inc with conclusion that a significant portion of site suitable for reuse in present state
 - 2007 -- City Commission initiated planning process for Farmland Industries Redevelopment Plan
 - o 2008 -- Governing Bodies adopted Farmland Industries Redevelopment Plan
 - o 2009 -- City annexed property
 - 2009 City acquired property
 - O 2009 -- Governing Bodies adopted updated Horizon 2020 Chapter 7 with locational criteria evaluating the site
 - o 2010 -- City awarded demolition contract for clean-up of site
 - o 2011 -- City Commission hired Bartlett & West/CDM Smith to develop Master Plan
 - o 2012 -- Informational meetings held in May with surrounding property owners
 - o 2012 -- Rezoning, Preliminary Plat & SUP applications submitted in July

ATTACHMENTS

- Area map.
- Proposed rezoning exhibit.

GOLDEN FACTORS TO CONSIDER

CHARACTER OF THE AREA

- Former buffer area between Farmland Industries and Douglas County Fairgrounds property and mobile home park west of the fairgrounds access road.
- Majority of property does not have frontage on K-10 and sits behind the commercial properties along the frontage road.

CONFORMANCE WITH HORIZON 2020

• The proposed request is consistent with land use recommendations found in *Horizon 2020* and the *Farmland Industries Redevelopment Plan*.

ASSOCIATED CASES/OTHER ACTION REQUIRED

Items being considered at the September Planning Commission meeting:

- Rezoning request [Z-12-00119] approximately 31.7 acres (and adjacent railroad r-o-w) from I-4 (Heavy Industrial) and VC (Valley Channel) Districts to UR-FP (Urban Reserve Floodplain Overlay) District, located in the NE1/4 & NW1/4 Sec 4-13-20.
- Rezoning request [Z-12-00120] approximately 170.4 acres (and adjacent railroad r-o-w) from I-4 (Heavy Industrial) District to UR (Urban Reserve) District, located in the NE1/4 & NW1/4 Sec 4-13-20.
- Rezoning request [Z-12-00121] approximately 170.7 acres (and adjacent highway r-o-w) from I-4 (Heavy Industrial), I-1 (Limited Industrial), A (Agricultural) County Districts and CC200 (Community Commercial Center) City District to IG (General Industrial) District, located in the NW1/4 & SW1/4 Sec 4-13-20.
- Preliminary Plat of the former Farmland Industries property [PP-12-00101]
- Special Use Permit [SUP-12-00100] for relocation and construction of a Westar substation to provide electricity to the Former Farmland Industries property and surrounding properties.

Other action required:

- City Commission approval of rezoning requests and adoption of ordinances.
- City Commission approval of the Special Use Permit and adoption of ordinance.
- Publication of rezoning and Special Use Permit ordinances.
- Submittal of Final Plat for administrative approval and recordation.
- City Commission acceptance of dedication of easements and rights-of-way for the Final Plat.
- Release of Special Use Permit site plan to Development Services for Building Permits.
- Submission and approval of administrative site plans for individual lot development within the business park.

PUBLIC COMMENT RECEIVED PRIOR TO PRINTING

• Email from Kate Dinneen regarding rezoning of A zoned property

Project Summary:

This property includes approximately 59 acres. The property has approximately 1227 feet of frontage along E 1575 Road which currently provides limited access to the fairgrounds property. The property also has approximately 350 feet of frontage along K-10/E 23rd Street and includes the proposed signalized intersection with O'Connell Road to the south. The request proposes to rezone the property to the IM (Medium Industrial) District.

1. CONFORMANCE WITH THE COMPREHENSIVE PLAN

The Comprehensive Plan recognizes the need to identify an adequate amount of available land in Douglas County to meet diverse industrial and business related development needs. *Chapter* 7 – *Industrial & Employment-Related Land Use (Policy 2.1)*, identifies general locational criteria for industrial developments which include:

- feasible access to Federal and State transportation networks;
- adequate parcel size, generally over forty acres;
- lie primarily outside of the regulatory floodplain; and
- have minimal average slopes.

The Plan identifies this site as meeting these general criteria.

The proposed zoning provides transition from west to east with lesser intense uses anticipated in the proposed IM District which borders the fairgrounds property and existing residential uses to the west.

The community's need to identify land for future business parks is again stated in *Chapter 12 – Economic Development, Policy 6: Business Infrastructure, Priority 6.1: Business Park Development.* The chapter states "Douglas County must identify land for future business and corporate business parks that takes advantage of the airport, the interstate/highway system, and the westward growth of Johnson County. Within the next few years, the City and County Commissions shall identify and designate at least 1000 acres of land for industrial expansion over the next 25 years. The commissions shall also put in motion the capitalization and infrastructure development needed to bring those 1000 acres into productive use."

The *Farmland Industries Redevelopment Plan* brings together the community goals of creating additional employment and open space by providing a plan to redevelop a brownfield into a major community asset. The plan indicated this portion of the property would be suitable for civic uses to potentially accommodate expansion of the fairgrounds. The most recent fairgrounds master plan does not anticipate expansion here. Civic uses are permitted in the IM District and moderate uses are a suitable use adjacent to the residential and civic properties to the west.

Staff Finding -- The proposed rezoning is in conformance with the recommendations in *Horizon 2020* and the *Farmland Industries Redevelopment Plan*.

2. ZONING AND USE OF NEARBY PROPERTY, INCLUDING OVERLAY ZONING

Current Zoning and Land Use: I-1 (Limited Industrial), B-1 (Neighborhood Business), A (Agricultural) [County Districts] and IG (General Industrial) District; vacant (southwestern portion of former Farmland Industries property) and portion of Westar electrical sub-station (to be relocated to the north).

Surrounding Zoning and Land Use: To the north: IG (General Industrial) District; automotive salvage and recycling.

> To the south: CS (Commercial Strip), UR (Urban Reserve), RS10 (Single-Dwelling Residential) and CO (Commercial Office) Districts; existing commercial businesses and Knights of Columbus along frontage road and undeveloped property along south side of K-10/E 23rd Street.

> To the east: I-4 (Heavy Industrial) [County District]; former Farmland Industries office building, portion of Westar electrical substation (to be relocated to the north) and vacant (southern portion of former Farmland Industries property).

> To the west: GPI (General Public & Institutional) District and RS7 (Single-Dwelling Residential) District; Douglas County Fairgrounds and existing mobile home park.

Staff Finding -- The surrounding property is a mix of city and county zoned property. The majority of the area is county industrial property that is the former Farmland Industries property to the east. The properties to the south are commercially zoned properties along the highway frontage road. Property to the west includes the residentially zoned mobile home park and the GPI zoned county fairgrounds. Immediately to the north are industrially zoned auto salvage/recycling businesses.

3. CHARACTER OF THE NEIGHBORHOOD

Staff Finding -- This area is located between the eastern city limits and the East Hills Business Park along K-10 highway. It had been used as a buffer area to the fertilizer plant for more than 50 years. The City developed around the former Farmland Industries property with the island annexation of East Hills in the mid-1980s. This area has been anticipated as a natural expansion of industrial park sites for many years.

4. PLANS FOR THE AREA OR NEIGHBORHOOD, AS REFLECTED IN ADOPTED AREA AND/OR SECTOR PLANS INCLUDING THE PROPERTY OR ADJOINING PROPERTY

Staff Finding – This property was studied in detail through the development of the *Farmland Industries Redevelopment Plan.* The plan brings together the community goals of creating additional employment and open space by providing a plan to redevelop a brownfield into a major community asset. The plan indicated this portion of the property would be suitable for civic uses to potentially accommodate expansion of the fairgrounds. The most recent fairgrounds master plan does not anticipate expansion here. Civic uses are permitted in the IM District and moderate uses are a suitable use adjacent to the residential and civic properties to the west.

5. SUITABILITY OF SUBJECT PROPERTY FOR THE USES TO WHICH IT HAS BEEN RESTRICTED UNDER THE EXISTING ZONING REGULATIONS

The request is to rezone the property to the IM District. Since the property has been annexed into the city, the county zoning designations are no longer appropriate. The property is within the boundary of the *Farmland Industries Redevelopment Plan* and within an area designated for future industrial development.

Staff Finding – The current county zoning designations are no longer appropriate since the property has been annexed into the city. Rezoning to the Medium Industrial District provides a transition from the lesser intense uses to the west and the planned General Industrial uses to the east.

6. LENGTH OF TIME SUBJECT PROPERTY HAS REMAINED VACANT AS ZONED

Staff Finding – The property is currently undeveloped except for a portion of the Westar substation that was constructed more than 50 years ago. The county zoning designations have been in place since 1966 when the County adopted zoning regulations. The IG portion was zoned M-3 (Intensive Industrial) when the Pyle Subdivision was approved in 1976 and converted to the IG District in 2006. That portion of the property was never developed.

7. EXTENT TO WHICH APPROVING THE REZONING WILL DETRIMENTALLY AFFECT NEARBY PROPERTIES

Staff Finding – The property was annexed in July 2009 and the County Districts are no longer appropriate. The property must be rezoned to a City of Lawrence zoning district prior to development. Rezoning to the IM District provides a transition of moderate industrial uses on the western edge of the planned business park. Approval of the request is not anticipated to detrimentally affect nearby properties.

8. THE GAIN, IF ANY, TO THE PUBLIC HEALTH, SAFETY AND WELFARE DUE TO THE DENIAL OF THE APPLICATION, AS COMPARED TO THE HARDSHIP IMPOSED UPON THE LANDOWNER, IF ANY, AS A RESULT OF DENIAL OF THE APPLICATION

Evaluation of this criterion includes weighing the benefits the denial of the rezoning request would provide for the public versus the hardship the denial would impose on the owner of the subject property. Benefits are measured based on the anticipated impacts of the rezoning request on the public health, safety and welfare.

Staff Finding – If the rezoning request were denied, the area would remain a mix of zoning districts and could not be developed for future expansion of the community's tax base. Approval of the request provides the opportunity to develop a coordinated business park with a transition of uses between existing residential, civic and commercial uses to the general industrial uses planned for the majority of the park. The gain to the public is the addition of a substantial number of acres of industrial property and the ability to offer new sites for potential job growth in the community.

9. PROFESSIONAL STAFF RECOMMENDATION

Section 20-216(a) the purpose of the IM District as follows:

The IM, Medium Industrial District, is intended to accommodate moderate-impact industrial facilities and wholesale, storage and distribution operations.

This majority of this portion of the former Farmland Industries property does not have highway frontage or visibility since it is located north of the commercial properties along the frontage road and adjacent to the fairgrounds access road. Most of this property will have internal access from the new business park streets and will provide a transition between the residential and fairground uses to the west and the anticipated general industrial uses to the east. If this request is approved, additional development standards including final platting, site planning, and compliance with applicable design guidelines will be considered with future development applications.

This staff report reviews the proposed location for its compliance with the Comprehensive Plan, the Golden Factors, and compatibility with surrounding development. The development proposal meets the locational criteria required for approval. The rezoning request is compliant with recommendations in *Horizon 2020* and *Farmland Industries Redevelopment Plan*. Staff recommends approval of the rezoning request for 59.0 acres from I-1 (Limited Industrial), B-1 (Neighborhood Business), A (Agricultural) and IG (General Industrial) to IM (Medium Industrial) District and forwarding it to the City Commission with a recommendation for approval based on the findings of fact found in the body of the staff report.

From:Sheila StogsdillTo:Sheila StogsdillSubject:FW: website comment - Z-12-00122Date:Monday, September 10, 2012 10:21:28 AM

From: Kate Dinneen [mailto:kld310@earthlink.net] Sent: Thursday, September 06, 2012 11:43 AM To: Sheila Stogsdill Subject: Re: website comment - Z-12-00122

Thank you for your reply and your further explanation. I appreciate your work!

Kate

----- Original Message -----From: Sheila Stogsdill To: 'kld310@earthlink.net' Cc: Scott McCullough ; Megan Gilliland Sent: Wednesday, September 05, 2012 5:12 PM Subject: website comment - Z-12-00122

Ms Dinneen -

Thank you for your comments regarding the proposed rezoning of a portion of the former Farmland Industries property. Your comments will be forwarded to the Planning Commission as part of the September packet later this month. Crop Agricultural uses are permitted in the Industrial Districts. Ag uses may be an interim use on portions of the property prior to ultimate business park uses are developed.

If you have other questions about the proposed development, please feel free to contact me.

Sheila M. Stogsdill, Assistant Director - <u>sstogsdill@lawrenceks.org</u> Planning & Development Services Department |<u>www.lawrenceks.org/pds</u> City Hall, 6 E. 6th Street P.O. Box 708, Lawrence, KS 66044-0708 office (785) 832-3157 | fax (785) 832-3160

"Your opinion counts! Customer feedback helps us serve you better. Please tell us how we're doing by completing this short online Customer Satisfaction Survey: <u>http://lawrenceks.org/pds/survey/satisfaction</u>."

From: Megan Gilliland Sent: Tuesday, September 04, 2012 7:00 AM To: Scott McCullough Subject: FW: Our goal: Better city service [#349]

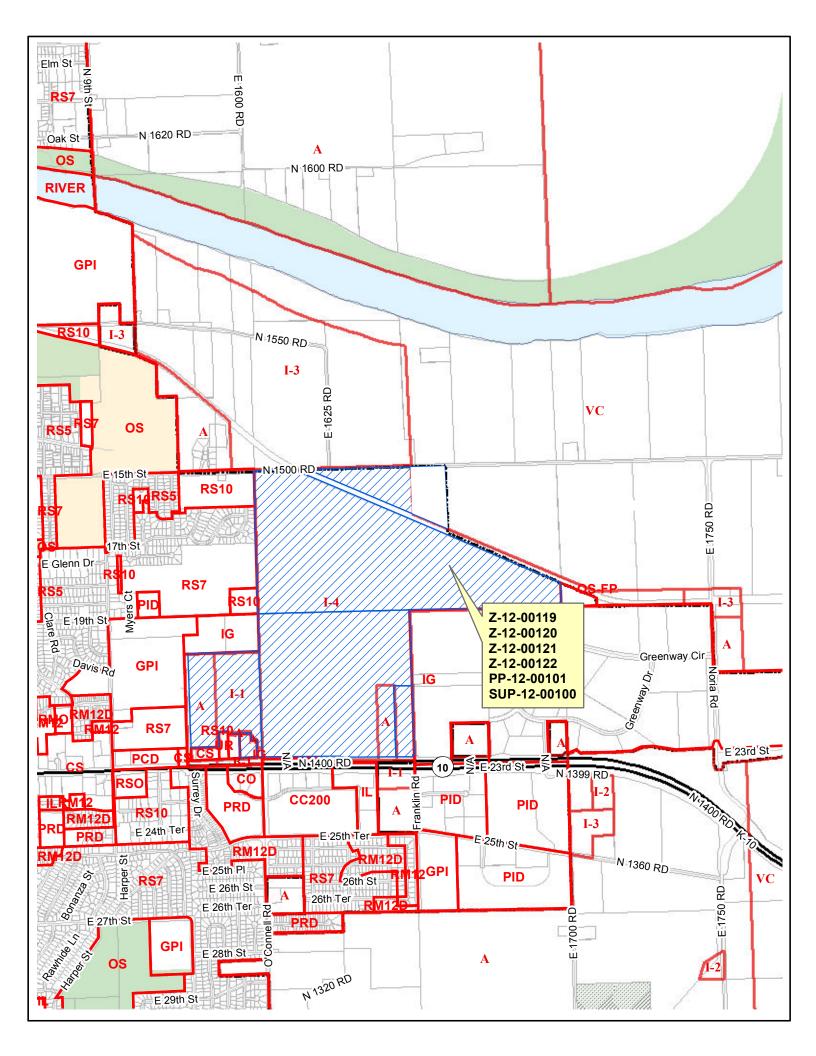
Correspondence for PC.

From: Wufoo [mailto:no-reply@wufoo.com] Sent: Monday, September 03, 2012 12:51 PM To: Megan Gilliland Subject: Our goal: Better city service [#349]

Subject: Sept 24 Planning Commission Meeting

Comments: I'd like to suggest that the commission remove the piece of Agricultural Zoned acreage from the Z-12-00122 proposed change to IM. The piece of land could still be used for agricultural purposes and as we continue to lose space for food growing it would be good to save it where we can. Unless, of course, it is part of the contaminated space.

Name: Kate Dinneen



PLANNING COMMISSION REPORT REGULAR AGENDA

PC Staff Report 9/24/12 ITEM NO. 4E:

4E: PRELIMINARY PLAT THE FORMER FARMLAND INDUSTRIES PROPERTY; N OF K-10 BETWEEN GREENWAY CIRCLE & E 1575 ROAD (SMS)

PP-12-00101: Consider a Preliminary Plat for the Former Farmland Industries property, an industrial subdivision containing 20 lots, 4 tracts and 4 greenway tracts. The property is located N of K-10 between Greenway Circle & E 1575 Rd. Submitted by Bartlett & West, for City of Lawrence, property owner of record.

STAFF RECOMMENDATION:

Staff recommends approval of the Preliminary Plat of the former Farmland Industries Property subject to the following conditions:

- 1. Provision of a revised plat including:
 - a. Dedication of full 50' of right-of-way for E 15th Street;
 - b. Dedication of a 15' utility easement along the south side of Lots 1 & 2, Block B to accommodate the planned sanitary sewer separate from the proposed 30' landscape easement, if needed;
 - c. Provision of a utility easement crossing Lots 7 & 8, Block C and Lot 1, Block D if the existing overhead power lines are not relocated;
 - d. Provision of actual minimum FFE on all lots adjacent to drainage easements once those elevations are determined; and
 - e. Provision of street names for all internal park streets and E 1575 Road.
- 2. Execution of revised access control agreements with KDOT prior to recording of a Final Plat.

Applicant's Reason for Request:

Subdivision requirement prior to construction of major utility and infrastructure for business park development.

KEY POINTS

- The property is identified in *Horizon 2020* and the *Farmland Redevelopment Plan* for future industrial development.
- Chronology of planning efforts related to this property:
 - o 2001 -- Farmland Industries plant shut down due to bankruptcy
 - o 2005 -- Substantial field work completed under direction by KDHE
 - 2006 -- Site Characterization Report completed by Shaw Environmental, Inc with conclusion that a significant portion of site suitable for reuse in present state
 - 2007 -- City Commission initiated planning process for Farmland Industries Redevelopment Plan
 - o 2008 -- Governing Bodies adopted Farmland Industries Redevelopment Plan
 - o 2009 -- City annexed property
 - o 2009 City acquired property

- 2009 -- Governing Bodies adopted updated Horizon 2020 Chapter 7 with locational criteria evaluating the site
- o 2010 -- City awarded demolition contract for clean-up of site
- o 2011 -- City Commission hired Bartlett & West/CDM Smith to develop Master Plan
- o 2012 -- Informational meetings held in May with surrounding property owners
- o 2012 -- Rezoning, Preliminary Plat & SUP applications submitted in July

ATTACHMENTS

- Preliminary Plat.
- Concept Plan.

SUBDIVISION CITATIONS TO CONSIDER

- This application is being reviewed under the Subdivision Regulations for Lawrence and Unincorporated Douglas County, effective Jan 1, 2007.
- Section 20-813 states that building permits will not be issued for unplatted property.

ASSOCIATED CASES/OTHER ACTION REQUIRED

Items being considered at the September Planning Commission meeting:

- Rezoning request [Z-12-00119] approximately 31.7 acres (and adjacent railroad r-o-w) from I-4 (Heavy Industrial) and VC (Valley Channel) Districts to UR-FP (Urban Reserve – Floodplain Overlay) District, located in the NE1/4 & NW1/4 Sec 4-13-20.
- Rezoning request [Z-12-00120] approximately 170.4 acres (and adjacent railroad r-o-w) from I-4 (Heavy Industrial) District to UR (Urban Reserve) District, located in the NE1/4 & NW1/4 Sec 4-13-20.
- Rezoning request [Z-12-00121] approximately 170.7 acres (and adjacent highway r-o-w) from I-4 (Heavy Industrial), I-1 (Limited Industrial), A (Agricultural) County Districts and CC200 (Community Commercial Center) City District to IG (General Industrial) District, located in the NW1/4 & SW1/4 Sec 4-13-20.
- Rezoning request [Z-12-00122] approximately 59.0 acres (and adjacent highway r-o-w) from I-1 (Limited Industrial), B-1 (Neighborhood Business); A (Agricultural) [County Districts] and IG (General Industrial) District to IM (Medium Industrial) District, located in the SE1/4 Sec 5-13-20 & SW1/4 Sec 4-13-20.
- Special Use Permit [SUP-12-00100] for relocation and construction of a Westar substation to provide electricity to the Former Farmland Industries property and surrounding properties.

Other action required:

- City Commission approval of rezoning requests and adoption of ordinances.
- City Commission approval of the Special Use Permit and adoption of ordinance.
- Publication of rezoning and Special Use Permit ordinances.
- Submittal of Final Plat for administrative approval and recordation.
- City Commission acceptance of dedication of easements and rights-of-way for the Final Plat.
- Release of Special Use Permit site plan to Development Services for Building Permits.

PLANS AND STUDIES REQUIRED

- Traffic Study The traffic study has been reviewed. City and KDOT staffs continue to discuss necessary improvements on K-10 to accommodate the business park use. The City has requested that the speed limit along this section of the highway be reduced to reflect arterial city street speeds. KDOT is reviewing access control agreements.
- *Downstream Sanitary Sewer Analysis* The downstream sanitary sewer analysis has been reviewed and is accepted for this project.
- *Drainage Study* A drainage study was prepared by CDM Smith (the City's consultant) and has been reviewed and accepted.
- *Retail Market Study* Not applicable to project.

PUBLIC COMMENT

No public comment was received prior to publication of this staff report.

Site Summary

Gross Area: Number of Existing Lots: Number of Proposed Lots: Right-of-Way Dedicated: Public Use Area Dedicated: Net Area included in proposed lots: 583.2 acres
11 unplatted parcels and 3 platted lots
20 lots, 4 tracts and 4 greenway tracts
25.4 acres
191.1 acres (portions of Tract A eventually may be
developed with business park uses following clean-up)
342 acres +/- (includes 32 acres in floodplain)

GENERAL INFORMATION

Current Zoning and Land Use:

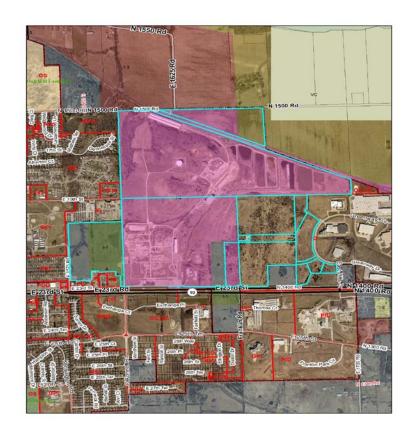
County Zoning Districts:

I-4 (Heavy Industrial),
I-1 (Limited Industrial),
B-1 (Neighborhood Business),
A (Agricultural) and
VC (Valley Channel)

and

City Zoning Districts:

IG (General Industrial) and CC200 (Community Commercial Center).



Portions of the plat include vacant land that was part of the former Farmland Industries property and the existing Westar electrical substation. Farmland Industries improvements that remain include: lab building, bag house, bulk warehouses, above-ground storage tanks and remediation ponds. The plat also includes the unplatted property located between existing East Hills Business Park and the former Farmland property and includes an existing AT&T communications tower. The area located between E 15th Street and the BNSF railroad tracks contains agricultural fields and is encumbered with floodplain.

Surrounding Zoning and Land Use:

To the north:

IG (General Industrial), I-3 (Heavy Industrial) and VC (Valley Channel) Districts; auto recycler/salvage yard north of the western portion of site and agricultural fields north outside of the city.

To the west:

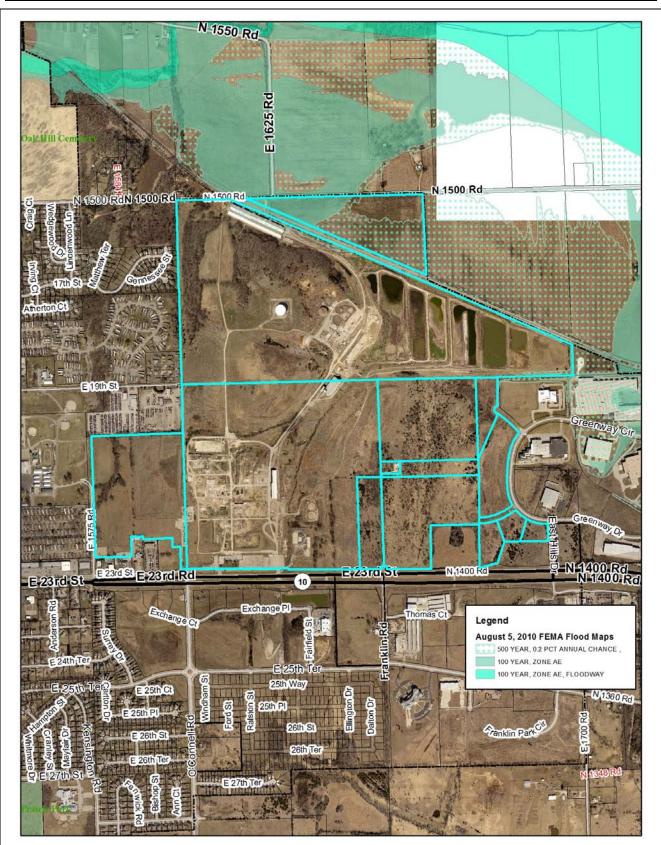
VC and IG Districts; agricultural fields and existing businesses in East Hills Business Park.

To the south:

PID – [LRM], PID – [Mt. Blue], I-1, IL (Limited Industrial), CC200, IG, RS10, UR and CS (Commercial Strip) Districts; concrete plant, storage company, church, retail and service uses.

To the east:

CS, RS7 (Single-Dwelling Residential) and GPI (General Public & Institutional) Districts; retail and service uses, mobile home park and County fairgrounds.



Floodway Fringe Overlay is regulated by Article 12 of the Development Code. The 500-year floodplain is not regulated by the code. Subject property is outlined.

STAFF REVIEW

The property included in this Preliminary Plat encompasses the former Farmland Industries property, an existing Westar electrical substation, an existing AT&T communications tower, unplatted parcels west of East Hills Business Park owned by Douglas County, and platted & unplatted portions of East Hills Business Park located west of Greenway Circle.

The former Farmland Nitrogen Manufacturing Plant operated east of Lawrence from 1954 to 2001. The City officially became the owner of the property in 2009. In 2011, extensive progress was made in demolishing over 35 structures and removal of over 1,600 tons of scrap metal for recycling. The City continues to work on the environmental clean-up of the property, which includes remediation efforts to pump ground water from portions of the site which has an overabundance of nitrogen from the fertilizer manufacturing operation. The City pumps the ground water to local farm fields as part of the remediation efforts.

The southern portions of the property are currently available for development and the northern portions are part of the active remediation efforts or are encumbered by floodplain. The plat therefore lays out the infrastructure network for the initial stages of development. The plat also shows the eventual extension of the main north-south street which will intersect with E 19th Street and ultimately provide access to the northern portions of the property. The initial infrastructure will provide an east-west street that connect to the existing East Hills business park and provides access to the properties at the west end located north of the existing commercial businesses along K-10. The main entrance to the park will be a signalized intersection at K-10/O'Connell Road. The extension of O'Connell Road will eventually tie into E 19th Street, but the initial phase will terminate approximately 1000 feet north of the east-west street. A second entrance providing right-in/right-out access will be constructed approximately midway between the new signalized intersection and the existing East Hills Drive intersection with K-10.

The Preliminary Plat also provides a development tract for the relocation of the existing Westar substation approximately a quarter of a mile into the property. The relocation is necessary because the existing substation is located in alignment with the planned intersection. This provides an opportunity to update the electrical equipment and remove it from its current visible location. The substation is a *Minor Utility* and requires approval of a Special Use Permit prior to construction. The related request, SUP-12-00100, is also on this month's agenda.

The Preliminary Plat provides 100' of right-of-way for all of the new streets in the business park. The additional right-of-way provides space for municipal utility extensions as well as construction of a *Complete Streets* profile including bike lanes and a multi-use path. Greenway Tracts are platted in natural drainage areas through the site to provide space for utility locations and stormwater conveyance or detention. The intent is that these Greenway Tracts will provide visual amenities throughout the park.

A large portion of Greenway Tract A includes the area that continues to be subject to remediation efforts and the series of lime & effluent runoff ponds and overflow ponds. Portions of this area will likely be available for business park development in the future. This property is proposed to be rezoned to UR (Urban Reserve) until such time it is ready for development.

A triangular shaped part of the northern parcel located between E 15th Street and the BNSF railroad tracks is partially encumbered by the floodplain. This property is proposed to be rezoned to UR – FP (Urban Reserve-Floodplain Overlay) and may be developed in the future when utilities are extended and E 15th Street is improved.

Zoning and Land Use

The property included in this preliminary plat encompasses over 580 acres. The southwestern portion includes vacant land that was part of the former Farmland Industries property and a portion of the existing Westar electrical substation. This area is currently zoned I-1 (Limited Industrial), B-1 (Neighborhood Business), A (Agricultural) and IG (General Industrial) District.

The majority of the highway frontage includes the former Farmland Industries lab building, a portion of the Westar electrical substation (to be relocated to the north), vacant parts of former Farmland Industries property and highway right-of-way. This part of the property is currently zoned I-4 (Heavy Industrial), I-1 (Limited Industrial), A (Agricultural) and CC200 (Community Commercial Center) District.

The central portion of the site is primarily vacant but also contains the existing bag house, bulk warehouses, above-ground storage tanks and remediation ponds. This area is zoned I-4 (Heavy Industrial) District. This part of the plat also includes the unplatted property between East Hills Business Park and the former Farmland property. An existing 205' AT&T communications tower is located in this area. This area was annexed into the City in 1986 and is zoned IG (General Industrial) District.

The area located between E 15th Street and the BNSF railroad tracks contains agricultural fields and is zoned I-4 (Heavy Industrial) and VC (Valley Channel) Districts. The western portion of this parcel is encumbered with floodplain and will be rezoned to the Floodplain Overlay District.

Streets and Access

The property is located between K-10 and E 15th Street. New north-south streets are planned at the intersection of K-10 & O'Connell Road and at a mid-point between this new intersection and the existing K-10 & East Hills Drive intersection. A new east-west street will tie into the existing East Hills Business Park properties at Greenway Circle and provide access to the new development lots planned in the southern portion of the property. Eventually the O'Connell Road extension will tie into E 19th Street providing additional options for traffic distribution and access.

A minor north-south street just west of the main entrance will be constructed to connect with the existing frontage road. This street will provide the commercial properties along the frontage road with access to the signalized intersection for improved safety.

Temporary cul-de-sacs are shown at the west end of the east-west street and on the O'Connell Road extension. The lots have been laid out to maximize flexibility in an effort to have large lots available for development. Lots along several of the cul-de-sacs can be combined if a potential tenant desires a large parcel. If individual lots are desired, the streets can easily be extended to accommodate smaller lots.

The plat also dedicates right-of-way along the western boundary where existing County right-ofway easement currently provides 'back door' access to the County fairgrounds. Eventually this street will be improved to city standards as adjacent lots are developed.

KDOT has access control along the majority of the highway frontage. The plat proposes to remove the access restrictions at the frontage road/north-south street intersection, the K-10/O'Connell Road intersection, and the right-in/right-out intersection. Three existing driveway access points at median breaks south of Lots 1, 2 & 3, Block B and the existing AT&T access point (at Lot 4, Block B) are proposed to be closed and access restricted. Access to the AT&T tower will eventually be provided from the north-south cul-de-sac adjacent to Lot 4, Block C.

Removal of access control is proposed between Tract A & B, at the K-10/O'Connell Road extension intersection, and east of Greenway Tract C. KDOT is currently reviewing right-of-way agreements that will need to be revised in conjunction with the plat proposals.

City staff has not yet determined what the business park name will be or internal street names. Street names will need to be determined prior to recording of a Final Plat for any portion of the property.

Utilities and Infrastructure

Utilities and infrastructure to accommodate the new business park will be extended in phases. Water and sanitary sewer are planned to be located in the 100' wide rights-of-ways or in the Greenway Tracts through the property. Additional utility easements are provided outside of the rights-of-ways to provide for private utility extensions. Significant Westar transmission easements also are provided along the north side of Block A and the west side of Block C.

Tracts A, B & C provide significant areas for Westar related improvements and the substation will be located on Tract D. The Subdivision Regulations define a Tract as follows: *"When part of a Platted Subdivision, a Tract is a Parcel reserved for open space, storm drainage, Easement purposes or an otherwise specific and restricted use."* Because of the unique nature of the utility improvements necessary to support the new substation and various ownership interests, it was determined through the platting process to create tracts for these uses. Access to Tract D is provided by Tract C. Building permits will be required prior to the installation of structures on these tracts. General Note 9 specifically identifies uses anticipated in these tracts.

Easements and Rights-of-way

As noted above, a substantial number of new easements will be provided throughout the property. Specific landscape easements are provided along the K-10 frontage and along the northern boundary of Block A. Specific Westar transmission easements are located to support the relocated substation improvements. An additional 50' easement is reserved for the City's future Noreaster Waterline improvement. An additional utility easement is needed along a portion of the highway frontage so that a new sanitary sewer is not located within the planned landscape easement. (This easement is only necessary if the sanitary sewer is constructed along the highway frontage. Ongoing discussions with the consultant and Utilities Department may result in a different configuration.)

The Greenway Tracts are also designed to serve as utility and stormwater easements through the property. The majority of Greenway Tract A is proposed to be zoned UR (Urban Reserve) because it contains portions of the property that are not immediately ready for development. Once clean-up efforts are completed, portions of this tract potentially could be replated to create development lots south of the BNSF railroad tracks.

Easements along side lot lines in Blocks A, B and C are not designated now in order to provide the most flexibility if lots should be combined for a large user. Similarly, front easements are not provided along the cul-de-sac streets in order to minimize the need to vacate multiple easements if lots are combined. Additional easements to serve a specific development can be provided at either the final plat or site plan stage in the review process.

Existing easements, including AT&T's access and utility easements to the communications tower, will be vacated with this plat. When the existing tower was constructed in 1992, the Zoning Ordinance did not require the establishment of setbacks related to fall zones. The Development Code currently requires a setback of $\frac{1}{2}$ the tower height when adjacent to residential property or a setback established based upon the fall zone determined by engineering standards. The tower is located in the northeast corner of the one acre parcel owned by AT&T and sits approximately 40' from the north and east lot lines. The property configuration creates a non-conforming condition for the cell tower, which will need to be cured through the site planning process in the future and may require variances and/or fall zone easements on the lot it is located on and adjacent lots.

As noted above, the street rights-of-ways throughout the park are 100' wide to accommodate *Complete Street* improvements. The main entry to the business park will be at the signalized intersection of K-10/O'Connell Road (extended). This access concept departs from the anticipated street concept in T2030 and the Farmland Redevelopment Plan. Those documents had anticipated the main entrance at Franklin Road with a minor arterial extension north intersecting with the minor arterial extension of E 19th Street into the park. Closer examination of the site terrain and highway profile determined that the entrance be moved west to O'Connell Road. The plat includes the east-west collector connection to East Hills Business Park and the minor arterial connection north to E 19th Street.

Conformance

The Comprehensive Plan recognizes the need to identify an adequate amount of available land in Douglas County to meet diverse industrial and business related development needs. *Chapter 7 – Industrial & Employment-Related Land Use (Policy 2.1)*, identifies general locational criteria for industrial developments which include:

- feasible access to Federal and State transportation networks;
- adequate parcel size, generally over forty acres;
- lie primarily outside of the regulatory floodplain; and
- have minimal average slopes.

The Plan identifies this site as meeting these general criteria.

Chapter 7 also includes specific criteria to be used in evaluating proposals at the development plan level. These include:

- preserve environmentally sensitive areas, including vegetative cover and wildlife habitat, to act as buffers and site amenities;
- encourage natural stormwater management, including locations that permit direct discharge to the floodplain;
- have available and adequate utilities, infrastructure and services (i.e. police and fire protection) for the proposed use;
- be compatible with existing and future zoning/land use patterns, including the use of appropriate buffers between land uses;
- be annexed before development if adjacent to municipal boundaries.

The Preliminary Plat, as designed, incorporates these criteria. The Greenway Tracts located throughout the property will contain stormwater conveyance and detention features and provide open space amenities to the business park. The plat provides for the relocation of the Westar electrical substation farther north into the property which offers an opportunity to upgrade facilities serving this part of the community. The substation requires numerous easements which are generally contained in Tracts A, B & C which will also provide open green space opportunities in the southwestern part of the property.

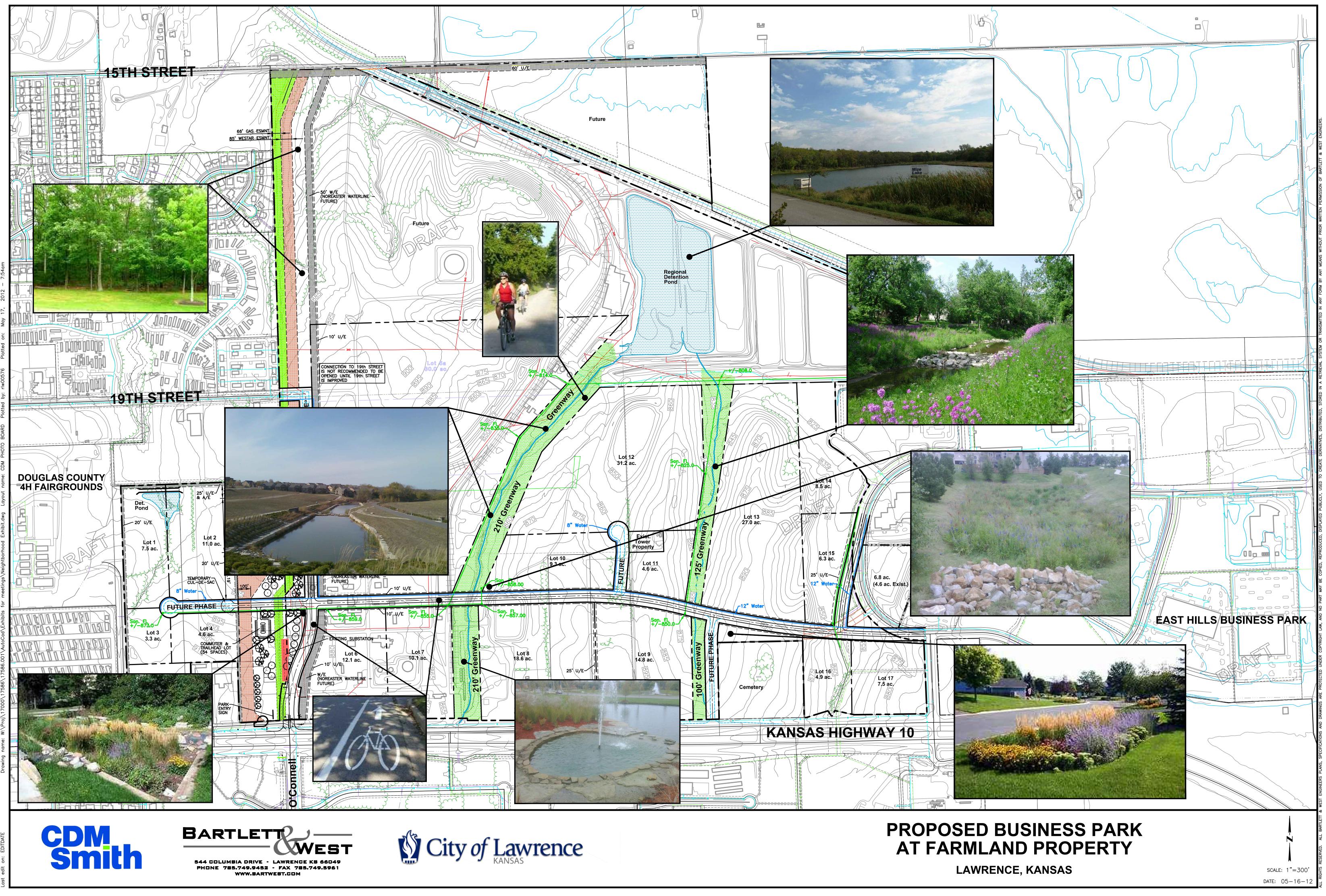
The proposed zoning provides transition from west to east with lesser intense uses anticipated in the proposed IM District which borders the fairgrounds property and existing residential uses to the west. Due to long term remediation efforts that are underway, the northern portions of the property will not be immediately available for development. The proposed UR and UR-FP Districts recognize that these areas are not yet ready for industrial uses.

The community's need to identify land for future business parks is again stated in *Chapter 12 – Economic Development, Policy 6: Business Infrastructure, Priority 6.1: Business Park Development.* The chapter states "Douglas County must identify land for future business and corporate business parks that takes advantage of the airport, the interstate/highway system, and the westward growth of Johnson County. Within the next few years, the City and County Commissions shall identify and designate at least 1000 acres of land for industrial expansion over the next 25 years. The commissions shall also put in motion the capitalization and infrastructure development needed to bring those 1000 acres into productive use."

In *Chapter 16 – Environment*, the Plan recommends using natural approaches to stormwater system design and management and utilizing Best Management Practices (BMPs) for stormwater structures and pollutant discharge, erosion and sediment control, and water quality. The Preliminary Plat has been designed to incorporate several large Greenway Tracts which will provide natural stormwater conveyance courses through the park. A substantial amount of open space will also be provided in the various Tracts adjacent to the entrances and surrounding the Westar substation. The attached Concept Plan illustrates various features designed into the business park layout including: regional detention, retention of mature trees, greenway tracts with stormwater amenities, recreational paths & trails, and the potential development of a park & ride/trailhead parking lot near the park entrance.

The *Farmland Industries Redevelopment Plan* brings together the community goals of creating additional employment and open space by providing a plan to redevelop a brownfield into a major community asset. The design of the proposed plat incorporates transportation and open space recommendations that will create linkages through the park and provide connectivity to East Hills and eventually to the neighborhoods to the northwest.

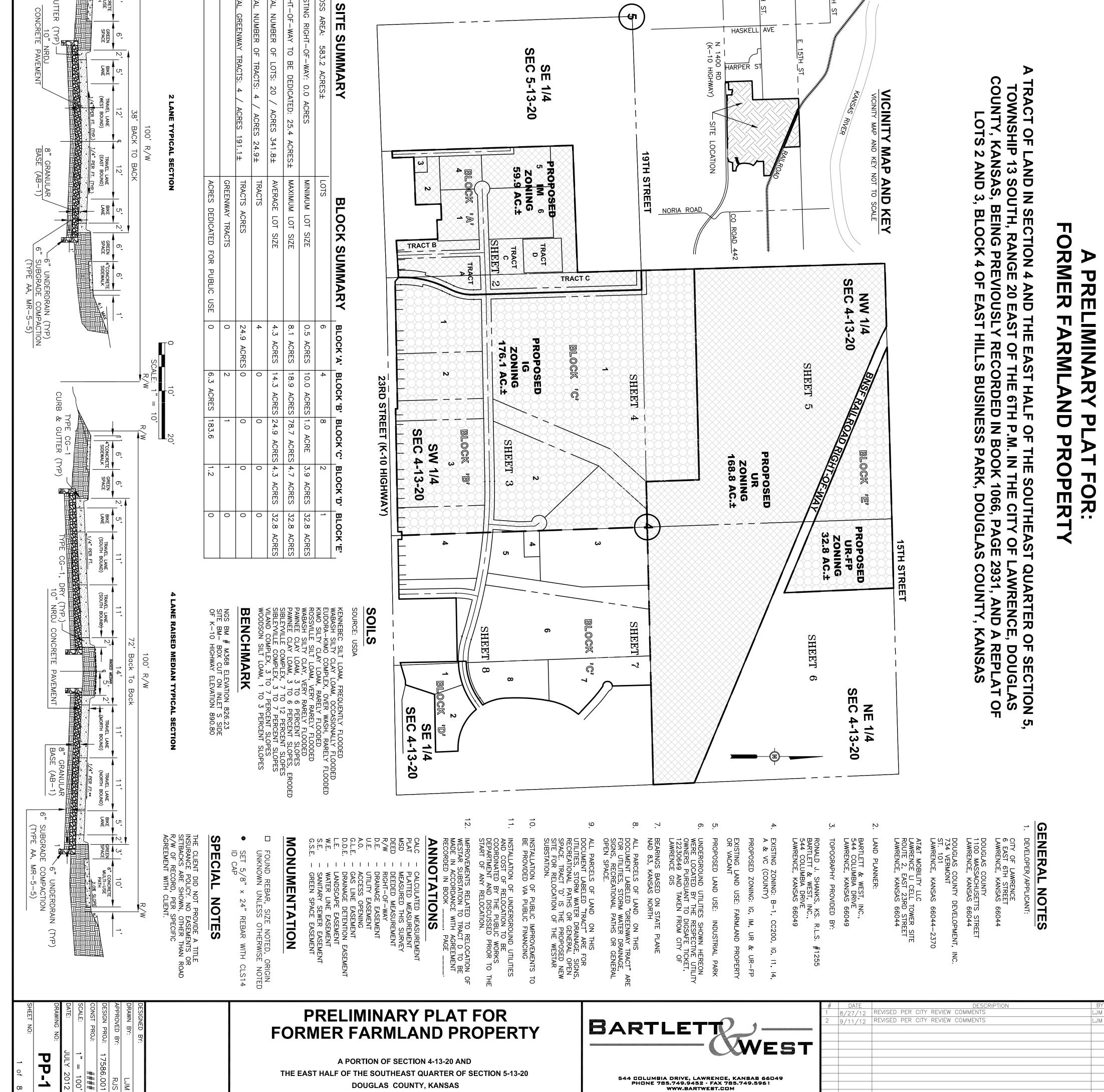
The preliminary plat, as conditioned, is in conformance with the recommendations in *Horizon 2020* and the design standards of the Subdivision Regulations and the Development Code.



Constraint A., Markow M. 2014, Markow M. L. 2014, Markow M. BEGINNING AT THE NORTHWEST CORNER OF THE NO DEGREES 33 MINUTES 08 SECONDS EAST, COINCIDED FEET TO THE NORTHWEST CORNER OF A TRACT OF DEGREES 26 MINUTES 58 SECONDS EAST, COINCIDED NORTHERLY RIGHT-OF-WAY LINE OF THE BNSF RAIL WEST, COINCIDENT WITH SAID RIGHT-OF-WAY LINE, : WITH SAID RIGHT-OF-WAY LINE, HAVING A RADIUS C BEARS NORTH 65 DEGREES 27 MINUTES 16 SECOND QUARTER OF SAID SECTION 4; THENCE NORTH 88 D NORTH LINE, 1783.02 FEET TO THE POINT OF BEGIN A TRACT OF LAND IN SOUTH, RANGE 20 EA RECORDED IN BOOK 1 LAWRENCE, DOUGLAS COMMENCING 13 SOUTH, R/ COINCIDENT W CORNERSTONE 21 SFCONDS ZONE AE – AREAS OF 500 YEAR FLOOD; AREAS OF 100 YEAR FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 100 YEAR FLOOD. ₽₽ LSO, A TRACT M., DOUGLAS S PROPERTY LIES RTIONS OF PROPER OWN ON FEMA FLO 045C0179D, WITH , GUST 5, 2010. 0 S 0 Ω **RIPTIO** PLAIN OF LAND IN THE COUNTY, KANSAS, IN SECTION EAST OF TH XK 1066, PAC AS COUNTY, MOSTLY WITHIN ZONE X, RTY LIE WITHIN ZONE AE AS OOD INSURANCE RATE MAP AN EFFECTIVE DATE OF Ζ DN 4 AND THE 6TH 1 PAGE 2931 Y, KANSAS, , DESCRIBED / RNER OF THE NORTHEAST QU, S EAST, COINCIDENT WITH THE OF A TRACT OF LAND RECOR S EAST, COINCIDENT WITH THE S EAST, COINCIDENT WITH THE IF THE BNSF RAILROAD; THENO T-OF-WAY LINE SEAT р_н AND A AS _ THE THS BE F SECTION FOLLOWS: NOF YEAR Ŕ MORE LOOD 000 **,**4 TOWNSHIP - OF DF SAID S LINE OF BOOK 1 13 SOUTH, 0 SECTION RANGE AS FOLLOWS 20 EAST Ū TOWNSHIP 13 EING PREVIOUSLY RK, CITY OF 9 THE 7 88 720.56 UTH 2 0 THE 6TH Ē CG CURB MASSACHUSETTS | ST ጵ

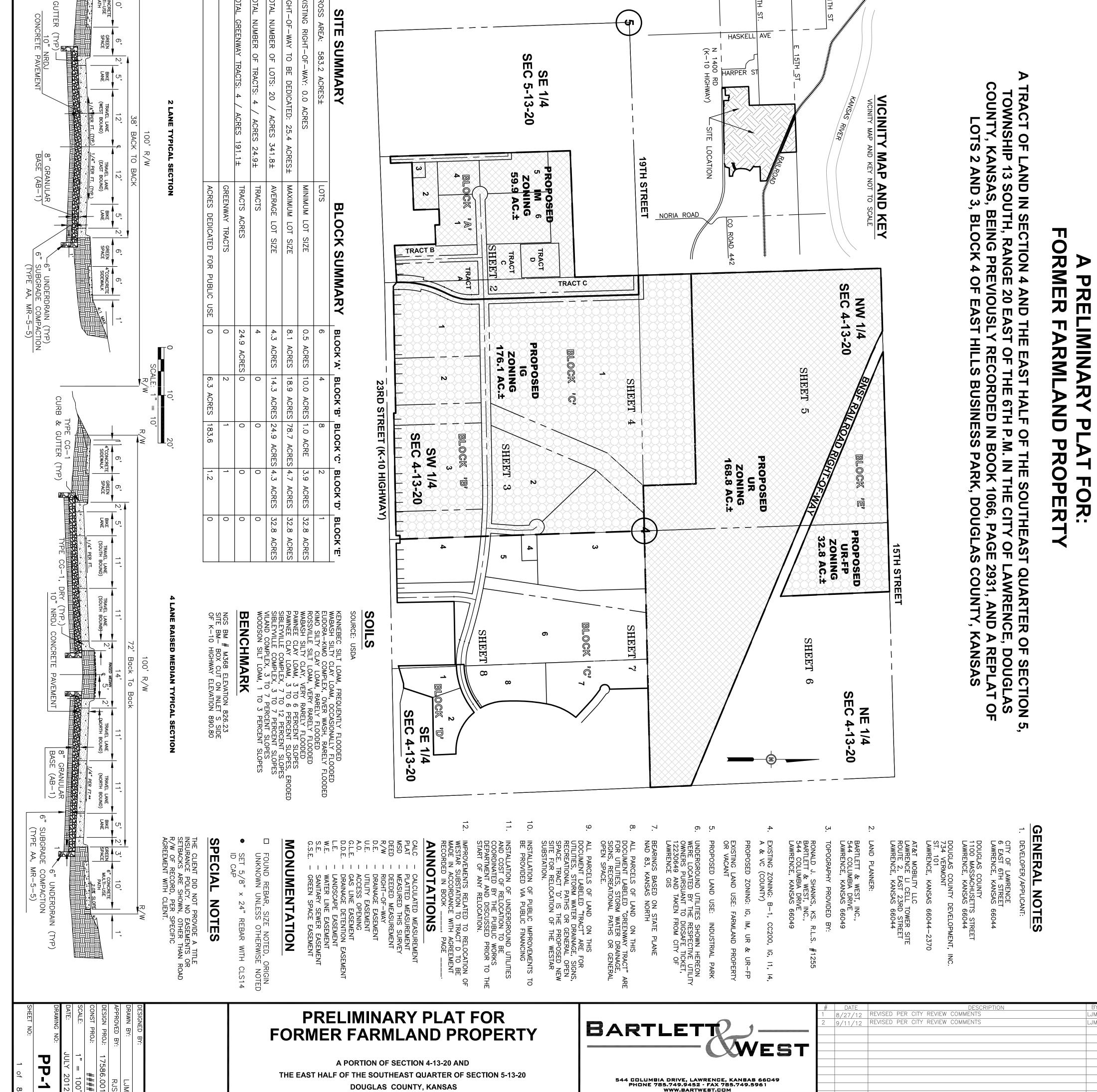
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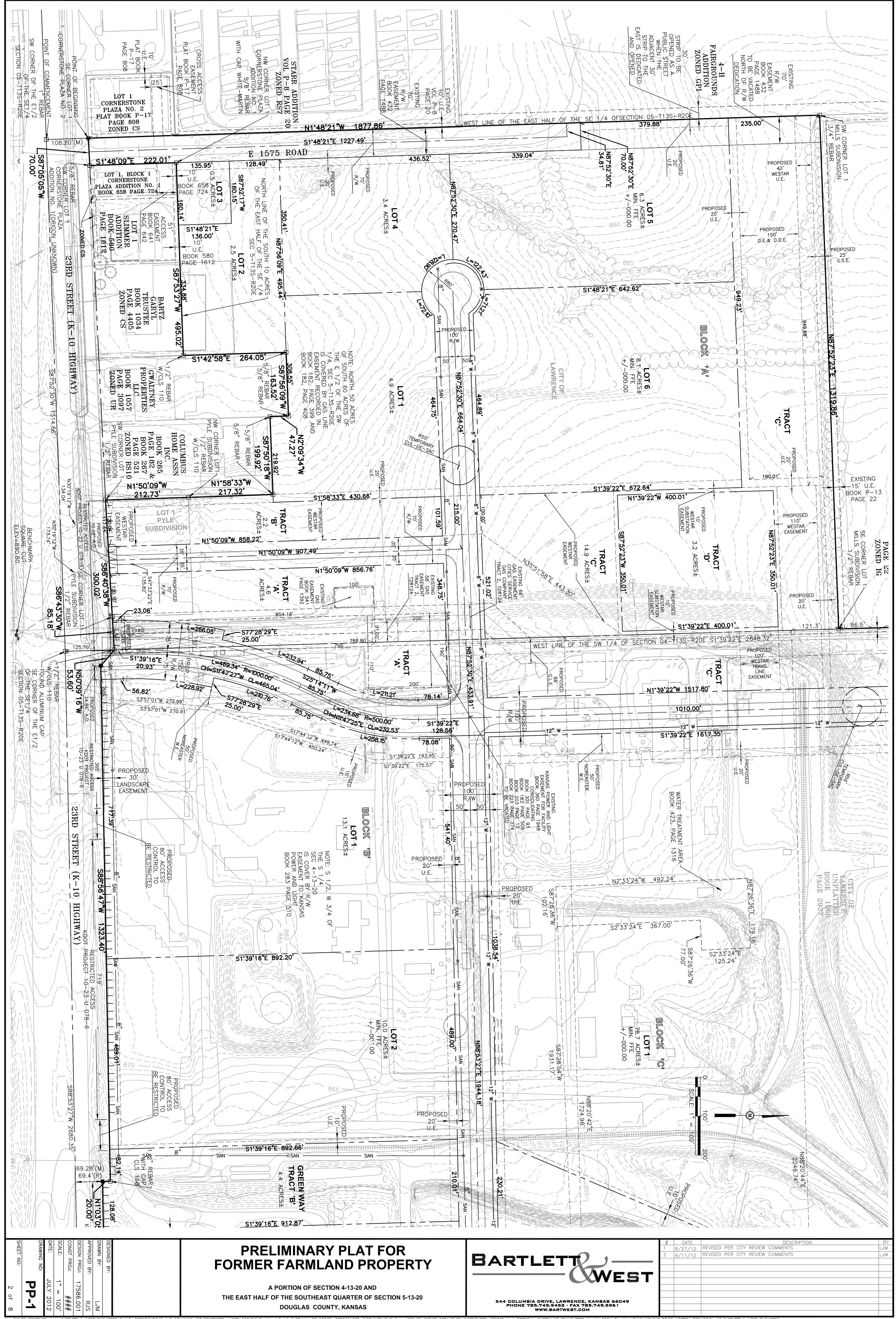
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TOTAL NUMBER OF LOTS: 20 / ACRES 341.8±	AVERAGE LOT SIZE	4.3 ACRES	14.3 ACRES 24.9 ACRES 4.3 ACRES	24.9 ACRES	4.3 ACRES	32.8 ACRES
TOTAL NUMBER OF TRACTS: 4 / ACRES 24.9±	TRACTS	4	0	0	0	0
TOTAL GREENWAY TRACTS: 4 / ACRES 191.1±	TRACTS ACRES	24.9 ACRES 0	0	0	0	0
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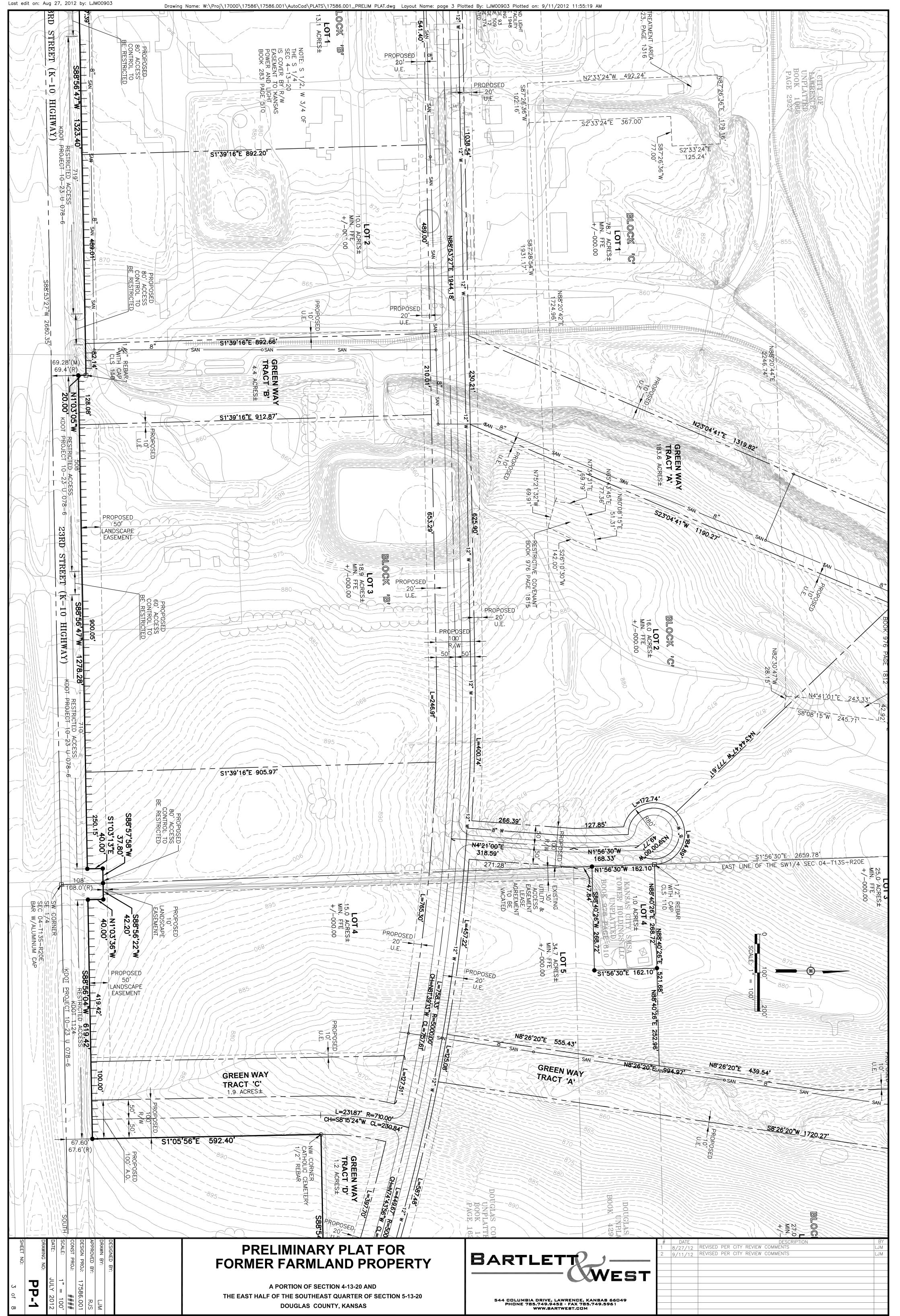
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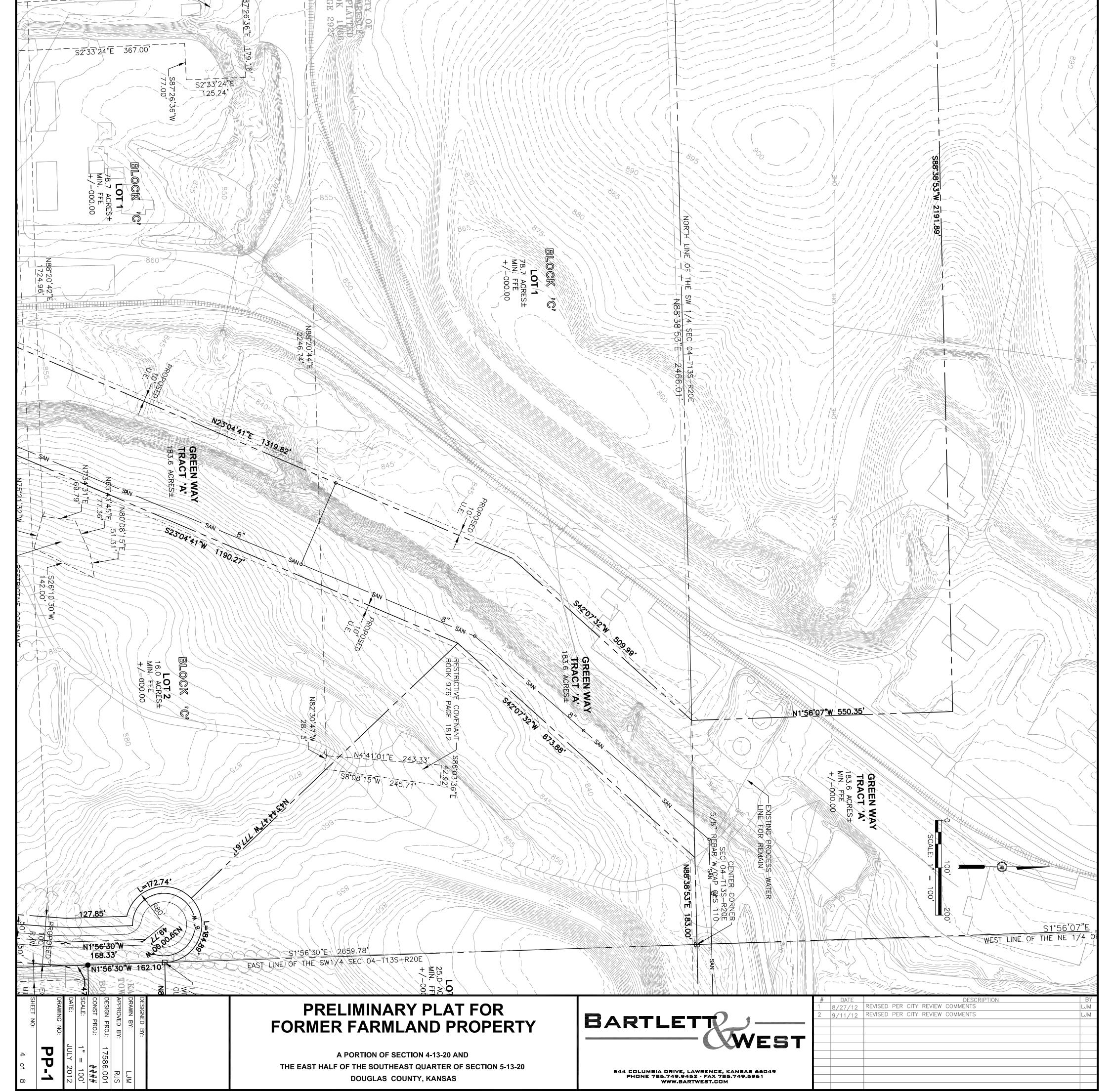
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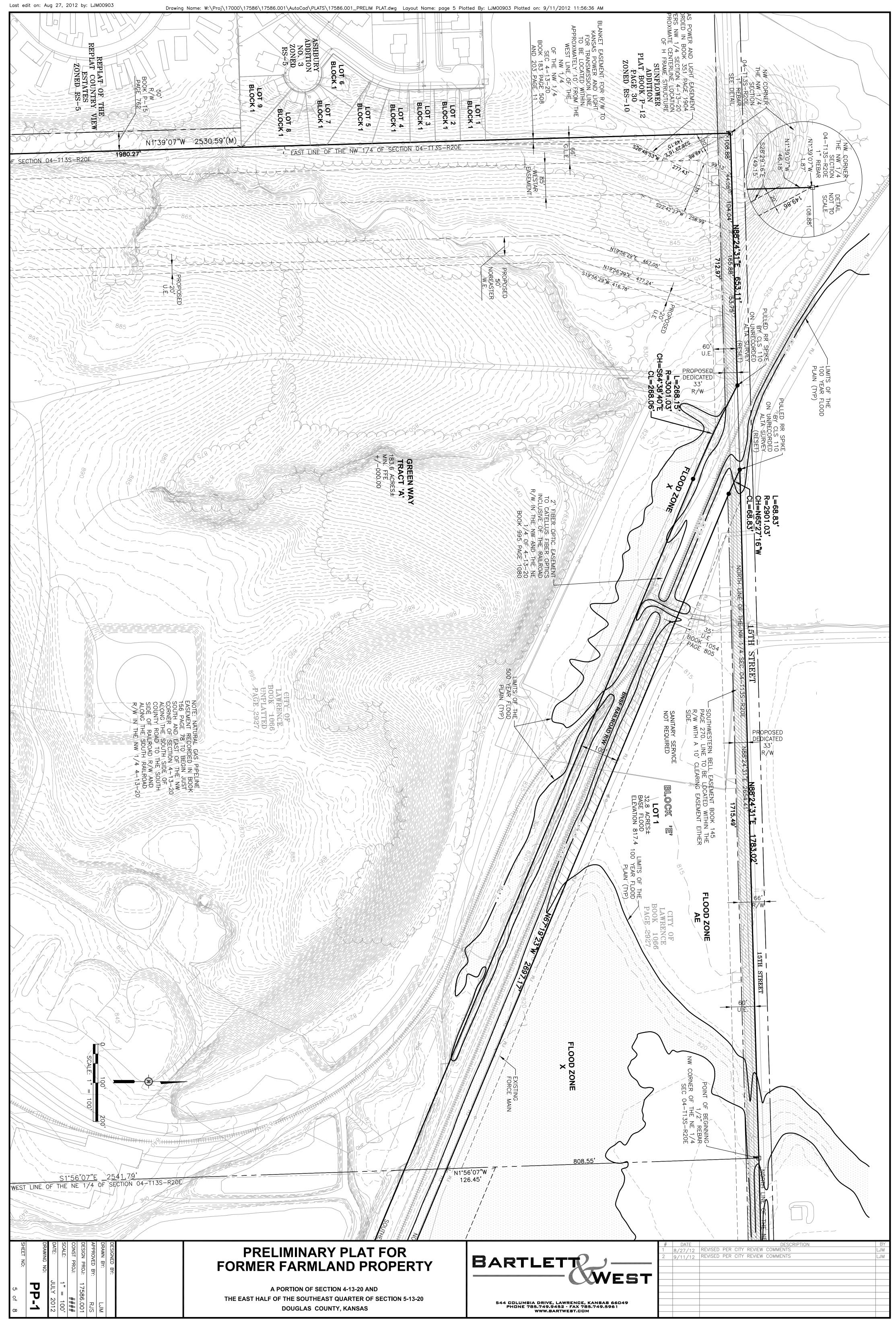




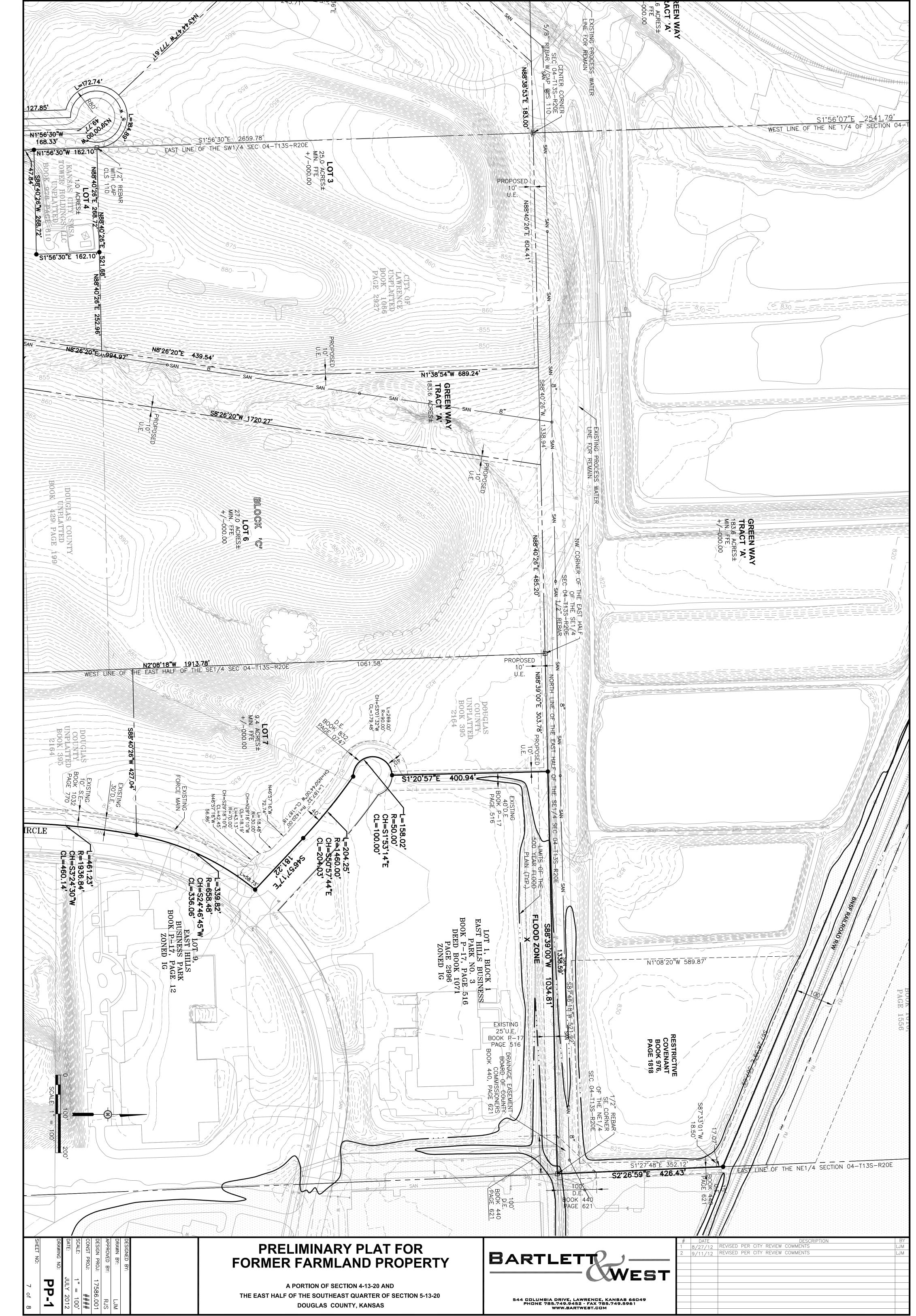
Drawing Name: W:\Proj\17000\17586\17586.001\AutoCad\PLATS\17586.001_PRELIM PLAT.dwg Layout Name: page 4 Plotted By: LJM00903 Plotted on: 9/11/2012 11:55:45 AM <u>190,01'</u> EXISTING 715' U.E. BOOK P-13 PAGE 22 N1'39'22"W 400.01 HORNER SUBDIVISION ZONED RS-10 REPLAT OF THE ESTATES ZONED RS-5 33' R/W BOOK 9-15 PAGE 691 PROPOSED 10' WESTAR SUBSTATION ÉASEMENT P PROPOSED 110' WESTAR EASEMENT NS NS ANKET EASEMENT FOR R/W TO KANSAS POWER AND LIGHT FOR TRANSMISSION LINE TO BE LOCATED WITHIN PPROXIMATELY 10' FROM THE WEST LINE OF SW 1/4 AND IN THE N1/2, SW 1/4 SEC 4-13-20 BOOK 183 PAGE 508 AND 203 PAGE 11 AND IN W CORNER OF THE NW1/4 SIDEWALK EASEMENT 5 04-T13S-R20E PAGE 691 1-66 SE CORNER N87"52"23"E LOT 1 MILLS BOOK P-13 PAGE 22 ZONED IG S<u>87°52'23"W</u> 33' 3.2 TRACT TRACT R/W BOOK P-13 PAGE 22 / POSED TAR EMENT ACREST VER LOT T 19TH 350,01 350.01 PAGE 31' — GAS LINE EASEMENT BOOK P-13 PAGE 22 0K/P-15 STREET WESTAR SUBSTATION EASEMENT 50. ROPOSE 66' G.L.E. PROPOSED 20' -U.E. . THE XV 10 THE NW J/4 OF SECTION 04-1135-R20E N1'39'22"W 662.18 WEST LINE OF <u>S1'39'22"E 400.01'</u> 86.5 500.33' 121.3 612.18 OF THE SW 1/4 OF SECTION 04-1135-R20E S1.39'22"E 2648.32" RVW PROPOSED 50' TRAC WESTARO TRAC 85 MESTAR TRANS. LINE ESMT EASEMENT <u>N1'39'22"W 1517.80</u> 00000 _1010.00' 5 12" W · 1⁄2″ _____12" w S1'39'22"E 1617.35' 0 BLANKET EASEMENT FOR R/W TO KANSAS POWER AND LIGHT FOR TRANSMISSION LINE TO BE LOCATED WITHIN APPROXIMATELY 10' FROM THE WEST LINE OF THE SOUTH 40 ACRES OF THE WEST 80 ACRES OF THE WEST 80 ACRES NOREASTER W.E. PROPOSED 50' NOREASTER W.E. , ВО 000 20, WATER BOOK REATMENT 1108 1316 ~ > <u>N2°33'24"W 492.24'</u>

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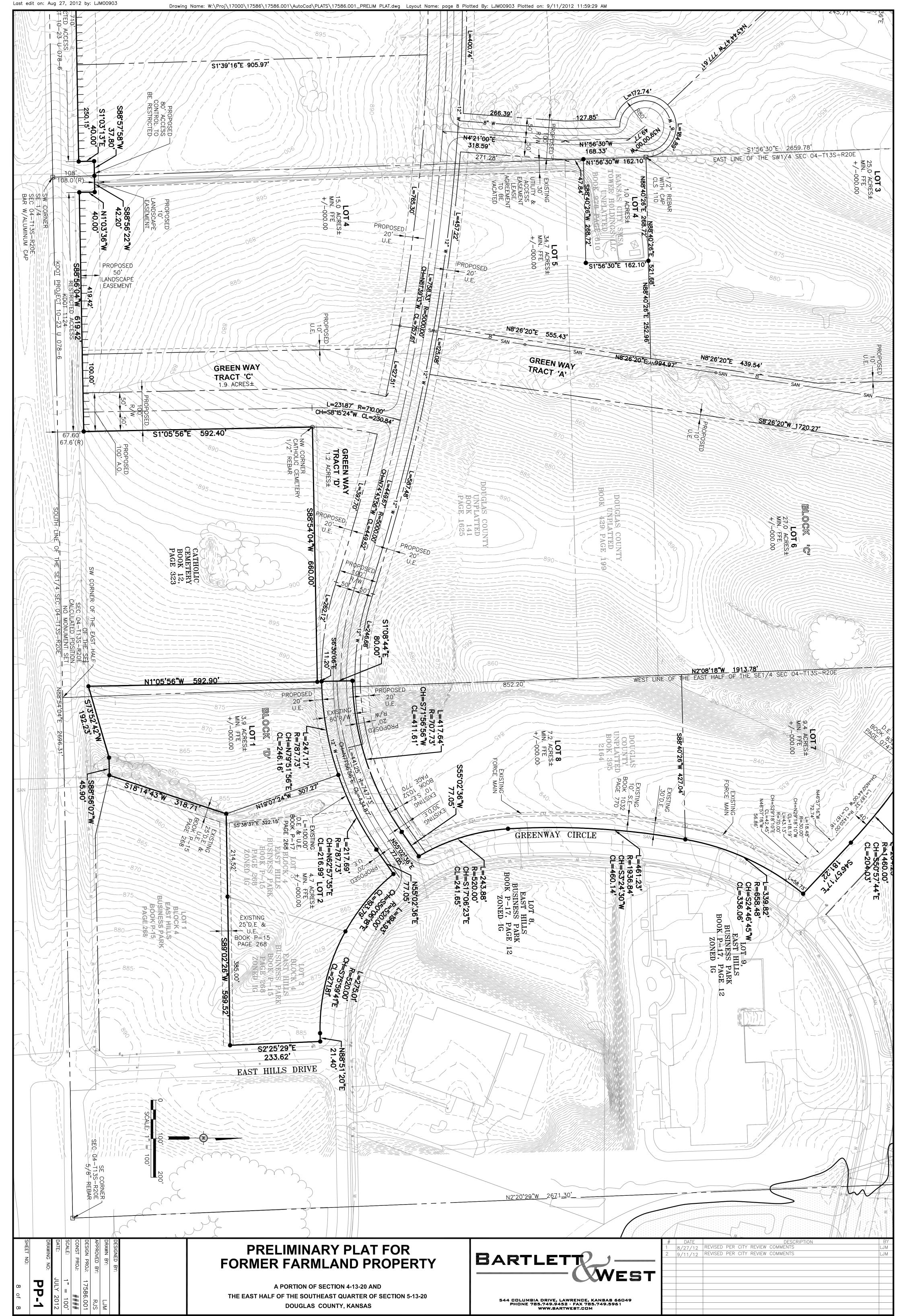


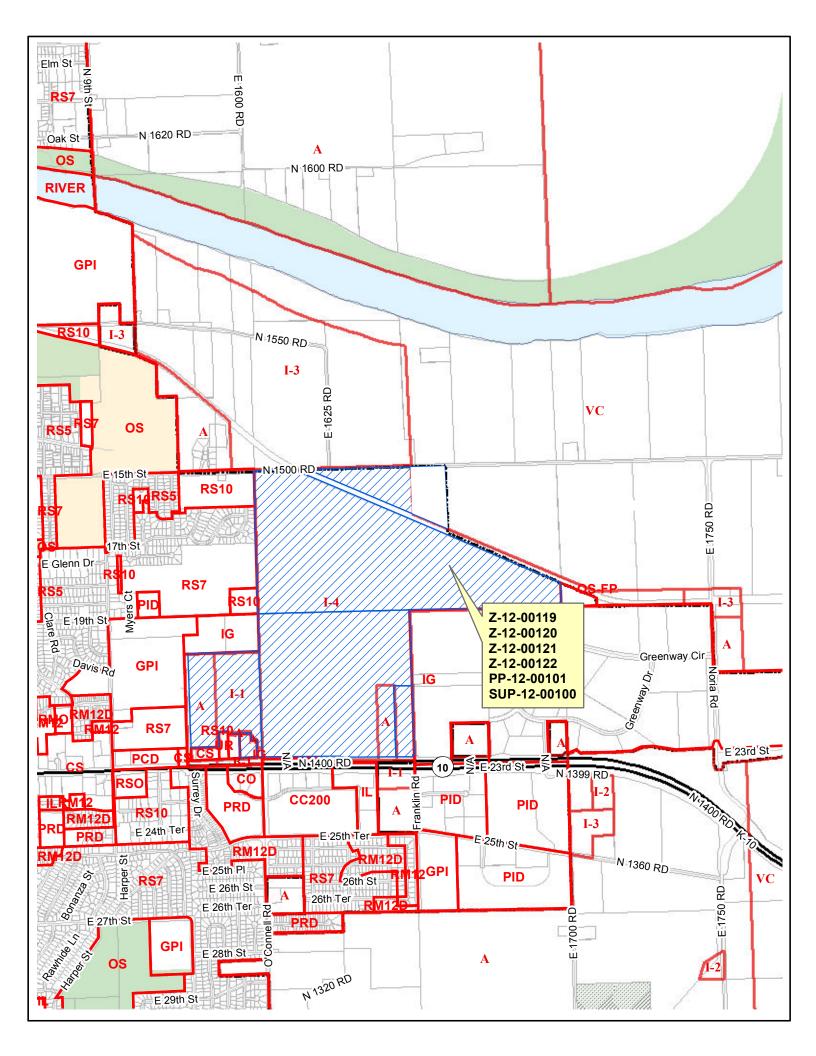




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September 12, 2012

RE: Don's Steakhouse Property – 2176 E 23rd Street

Mayor Schumm,

On behalf of my client, Gary Bartz, owner of the former Don's Steakhouse located at 2176 E. 23rd Street, we submitted a proposal last December for a 3 year option to buy the ground north of his property from the City of Lawrence at \$2 per square foot.

Since that time the concept completed by the City's consultants for the Farmland ground has been submitted to the City. Based off the information provided by the concept plan it makes sense to add this property to my clients ground. With that in mind we would like to move forward with his proposal to purchase the 1.46 acre piece of land north of his property. (See attachments)

We believe adding this ground to the site will give potential buyers of the property a better option for redevelopment and the potential of combing with the property to the east which is also for sale. Combining all three of these properties would provide 4.46 acres.

Access to the property is best served from the existing frontage road. Alternatively, if this ground is not sold to Don's Steak House the access to the lot would be from E. 1575 Road which would not be ideal.

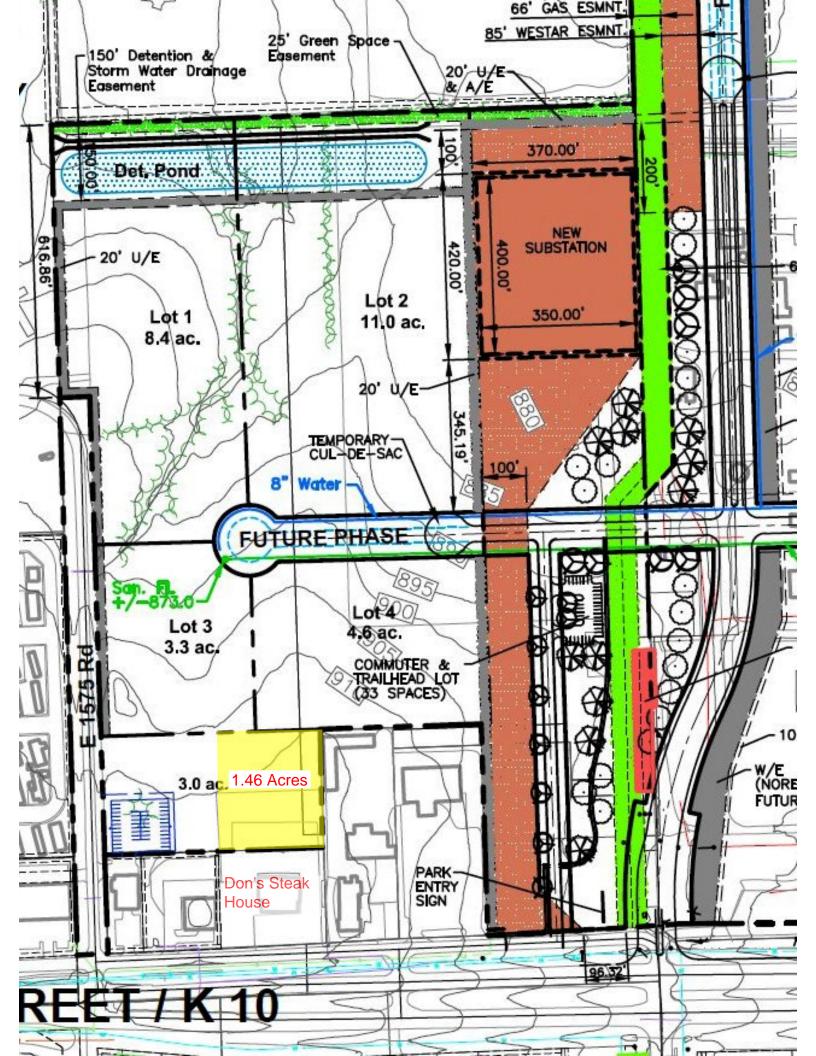
We would appreciate your consideration of this proposal and look forward to discussing it with you.

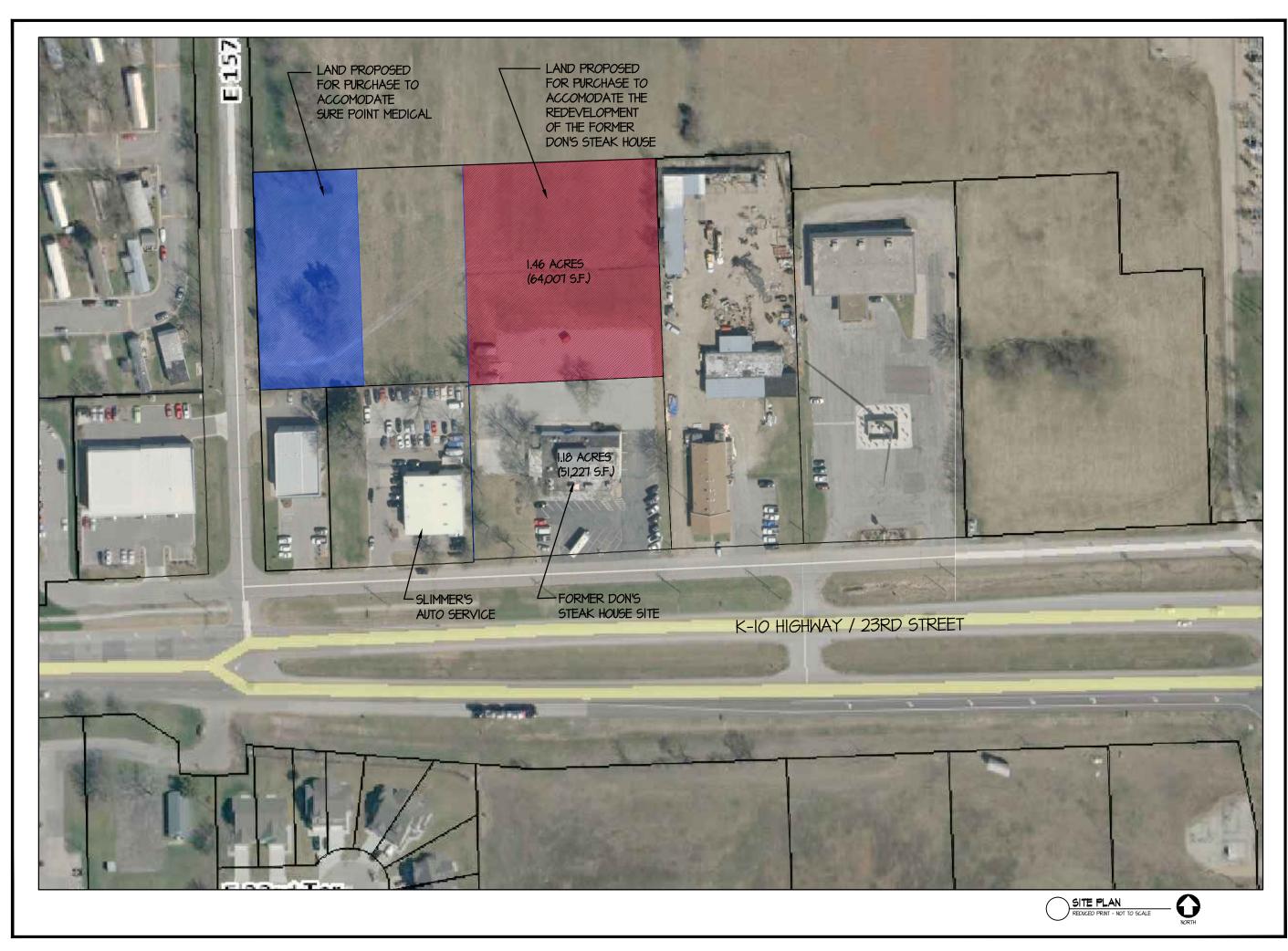
Respectfully,

al Wenn

Paul Werner

Cc: Gary Bartz Darron Ammann, Bartlett & West





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PROJECT # 211-440 DECEMBER 28, 2011 RELEASE: DATE:

PLANNING COMMISSION REPORT Regular Agenda – Public Hearing Item:

PC Staff Report 09/24/12 ITEM NO. 4F:

I NO. 4F: SPECIAL USE PERMIT FOR WESTAR SUBSTATION; N OF K-10 BETWEEN GREENWAY CIR & E 1575 RD (SMS)

SUP-12-00100: Consider a Special Use Permit for a Westar substation to provide electricity to the Former Farmland Industries property and surrounding properties. The property is located N of K-10 between Greenway Circle & E 1575 Rd. Submitted by Bartlett & West for Westar Energy.

STAFF RECOMMENDATION: Staff recommends approval of SUP-12-00-100, a Special Use Permit for , a *Minor Utility*, based upon the findings presented in the body of the staff report and subject to the following condition:

1. Review and approval of a landscape screening plan to be provided prior to final inspection of the substation improvements.

Applicant's Reason for Request: SUP required for use of property as a minor utility.

KEY POINTS

- An electrical substation is a *Minor Utility* which serves more than one specific development; therefore approval is required through a Special Use Permit per Section 20-530 of the Development Code.
- The proposal will relocate the existing electrical substation to provide for the construction of a new signalized intersection with K-10 and the major entrance to the business park.

FACTORS TO CONSIDER

• Procedural requirements of Section 20-1306; Special Use Permits.

ASSOCIATED CASES/OTHER ACTION REQUIRED

Other items being considered at the September Planning Commission meeting:

- Rezoning request [Z-12-00122] approximately 59.0 acres (and adjacent highway r-o-w) from I-1 (Limited Industrial), B-1 (Neighborhood Business); A (Agricultural) [County Districts] and IG (General Industrial) District to IM (Medium Industrial) District, located in the SE1/4 Sec 5-13-20 & SW1/4 Sec 4-13-20.
- Preliminary Plat for former Farmland Industries [PP-12-00101].

Other action required:

- City Commission approval of rezoning request and adoption of ordinance.
- City Commission approval of the Special Use Permit and adoption of ordinance

- Publication of rezoning and Special Use Permit ordinances.
- Submittal of Final Plat for administrative approval and recordation.
- City Commission acceptance of dedication of easements and rights-of-way for the Final Plat.

PLANS AND STUDIES REQUIRED

- *Traffic Study* Provided as part of Preliminary Plat submittal.
- *Downstream Sanitary Sewer Analysis* The City Utility Engineer indicated that a DSSA is not required.
- Drainage Study Provided as part of Preliminary Plat submittal.
- *Retail Market Study* Not applicable to project.

PUBLIC COMMENT

No public comment was received prior to the printing of this staff report.

GENERAL INFORMATION

Current Zoning and Land Use:

I-1 (Light Industrial) [County] District; [proposed rezoning to IM (Medium Industrial) City District]; undeveloped, former 'west' stormwater ponds on Farmland Industries property



Surrounding Zoning and Land Use:

To the north: IG (General Industrial) City District; auto recycler/salvage yard.

To the south and west: I-1 (Light Industrial) [County] District; [proposed rezoning to IM (Medium Industrial) City District]; undeveloped, former undeveloped Farmland Industries property



To the east and southeast: I-4 (Heavy Industrial) County District; [proposed rezoning to IG (General Industrial) City District; recently demolished portions of Farmland Industries plant and the existing electrical substation to be replaced by this development proposal.

Summary of Special Use

Westar currently has an electrical substation on the former Farmland Industries property which will be relocated to the northwest to accommodate the new K-10/O'Connell Road intersection. This request proposes to construct the new substation on Tract D which will be located west of the O'Connell Road extension and north of the new east-west street in the business park. Tract C, which surrounds Tract D on three sides, accommodates the numerous easements required for the substation and provides access to Tract D. Additional Westar easements are placed in Tract B to provide access to the highway right-of-way. The easement for the existing equipment (located in proposed Tract A) will be vacated with the plat for the new business park.

The proposed substation improvements include a compacted gravel pad enclosed by an 8' high black chain link fence with barbed wire on an approximately 3 acre tract. Perimeter lighting will be placed inside the fence with fixtures pointed down toward the equipment. The enclosure will contain new transmission equipment and cabinets. Additional transmission poles will be located within Tracts B & C as needed. An access drive from the east-west park street to Tract D will be located Tract C. The remainder of Tract C will be planted in turf with perimeter landscaping.

The relocation will occur in accordance with an agreement between Westar and the City. The agreement includes the design and planting of landscape screening by the City. The majority of this landscaping will occur on Tract C, but will also include landscaping on the east side of Lot 6, Block A. The landscape plan must be submitted for review and approval prior to completion of the substation construction. This agreement will be recorded at the Register of Deeds and recording information will be noted on the face of both the SUP and the Preliminary Plat.

The substation is defined as a *Minor Utility* in Section 20-1765 of the Development Code:

20-1765 UTILITIES, MINOR

Public utilities that have a local impact on surrounding properties. Typical uses include electrical and gas distribution substations, lift stations, telephone switching boxes, and water towers. Excludes "Wireless Telecommunication Facilities" use types.

SITE SUMMARY

	Existing	Proposed	Change
Property Area (sq ft):	140,007.50 SF	140,007.50 SF	-
Total Impervious Area (sq ft):	0	0	-
Total Pervious Area (sq ft):	140,007.50 SF	140,007.50 SF	-

Site Plan Review

This site is being platted as Tract D with the former Farmland Industries plat. The site plan shows the proposed location of the substation with the equipment pad, fence and a 3:1 slope around the perimeter to drain the pad to the south and east. A 350' long gravel drive will be constructed through Tract C from the main east-west business park street. Due to the infrequent usage and length of the drive through the mainly grassy Tract C, the Planning Director has waived the paving requirements of Section 20-913(e) for this access drive. The City Stormwater Engineer has indicated that the reduced impervious surface results in less drainage impact in the immediate area. The City Commission approval of the Special Use Permit will confirm this Development Code waiver.

Review and Decision-Making Criteria (20-1306(i))

1. WHETHER THE PROPOSED USE COMPLIES WITH ALL APPLICABLE PROVISIONS OF THIS DEVELOPMENT CODE

The proposed use, a *Minor Utility* which provides service to a large portion of the community, is an allowed use in the proposed IM (Medium Industrial) District subject to Special Use Permit approval.

A minimum of one off-street parking space is required for *Minor Utilities*. The site will be accessed by utility trucks for routine maintenance and there will be no employees on site. The substation is also designed with 20' wide double-swing gates which allow utility trucks to access the equipment pad, as needed. The length of the access drive provides plenty of space for vehicles in the event there is a need for multiple vehicles or equipment on-site at the same time.

A photometric plan has been submitted and approved for the perimeter lighting fixtures proposed.

The setbacks in the IM District are front — 25' and interior side and rear adjacent to nonresidential —15'. All equipment is located at least 15' inside of the Tract D boundaries. The 'front' of the Tract is technically Tract C which extends more than 350' south to the east-west street frontage. The maximum height in the IM District is 45'. Site sections provided indicate that all of the equipment except for transmission poles will be less than 30' tall. Power poles and similar utility structures are excluded from the maximum height limitations in Section 20-602 of the Development Code.

The location of the access drive does not meet the separation requirements from the intersection with the new north-south street located between Tracts A & B. Section 20-915(e)(2)(iii) requires 250' between a driveway and a collector street intersection. The location is restricted due to the numerous Westar easements and transmission pole placement. The City Engineer has waived this separation requirement due to the low volume use of this driveway as provided by Section 20-915(e)(3).

Staff Finding – With the approved administrative waivers, and as conditioned, the site plan complies with the requirements set out in the Development Code.

2. WHETHER THE PROPOSED USE IS COMPATIBLE WITH ADJACENT USES IN TERMS OF SCALE, SITE DESIGN, AND OPERATING CHARACTERISTICS, INCLUDING HOURS OF OPERATION, TRAFFIC GENERATION, LIGHTING, NOISE, ODOR, DUST AND OTHER EXTERNAL IMPACTS

The proposed substation will have less of a visual impact from K-10 than the existing substation due to its relocation a quarter mile north of the highway frontage. The equipment will be updated and surrounded by substantial greenspace and landscape screening. Per the City/Westar agreement, the City will maintain the landscaping around the perimeter of Tract D. The ample greenspace provided by the easements in Tract C provide the opportunity to minimize the visual impact the equipment will have within the business park. Exterior lighting is intended only when maintenance work is necessary during evening or night hours. Security lighting is intended to be minimal.

The only traffic to the substation will be for maintenance on the facility. There will be no increase in traffic, and perhaps less traffic as a result of the mechanical improvements, from that with the existing substation.

Updated equipment installation provides an added amenity in marketing the business park.

Staff Finding – The proposed relocated substation will be compatible with adjacent uses.

3. WHETHER THE PROPOSED USE WILL CAUSE SUBSTANTIAL DIMINUTION IN VALUE OF OTHER PROPERTY IN THE NEIGHBORHOOD IN WHICH IT IS TO BE LOCATED

The existing substation has been in place for over 50 years. The proposal to update equipment and relocate the substation farther north into the business park provides an opportunity to create a landscaped entrance to the park with a new signalized intersection. This will enhance the value of the proposed business park and provide enhanced service to portions of the surrounding community.

Staff Finding – The relocation of the substation is anticipated to enhance the value of the proposed business park and will not result in any diminution of value of other property in the area.

4. WHETHER PUBLIC SAFETY, TRANSPORTATION AND UTLITY FACILITIES AND SERVICES WILL BE AVAILABLE TO SERVE THE SUBJECT PROPERTY WHILE MAINTAINING SUFFICIENT LEVELS OF SERVICE FOR EXISTING DEVELOPMENT

The electrical substation is a public utility intended to serve the surrounding area. The proposed improvements within the proposed plat for the former Farmland Industries property will provide adequate access to the property and additional easements necessary to serve the new improvements. The driveway located on Tract C will provide adequate access for the limited traffic anticipated for the maintenance of the facility.

Staff Finding – The proposed use, a *Minor Utility*, is a public service which would serve the surrounding area. Sufficient safety, transportation and utility facilities will be available to serve the subject property.

5. WHETHER ADEQUATE ASSURANCES OF CONTINUING MAINTENANCE HAVE BEEN PROVIDED

Staff Finding – The site plan will function as the enforcement document to assure that maintenance and use of the property is consistent with the approval. In addition, the recorded City/Westar agreement spells out responsibilities during construction and landscaping responsibilities for the perimeter areas.

6. WHETHER THE USE WILL CAUSE SIGNIFICANT ADVERSE IMPACTS ON THE NATURAL ENVIRONMENT

Adequate oversight will be provided for the protection of the natural environment through the state regulatory oversight Westar facilities require and the City's ownership control of the surrounding portions of the business park site.

Staff Finding – The proposed use, with the protection measures required by State and Local governments, should not cause significant adverse impacts on the natural environment.

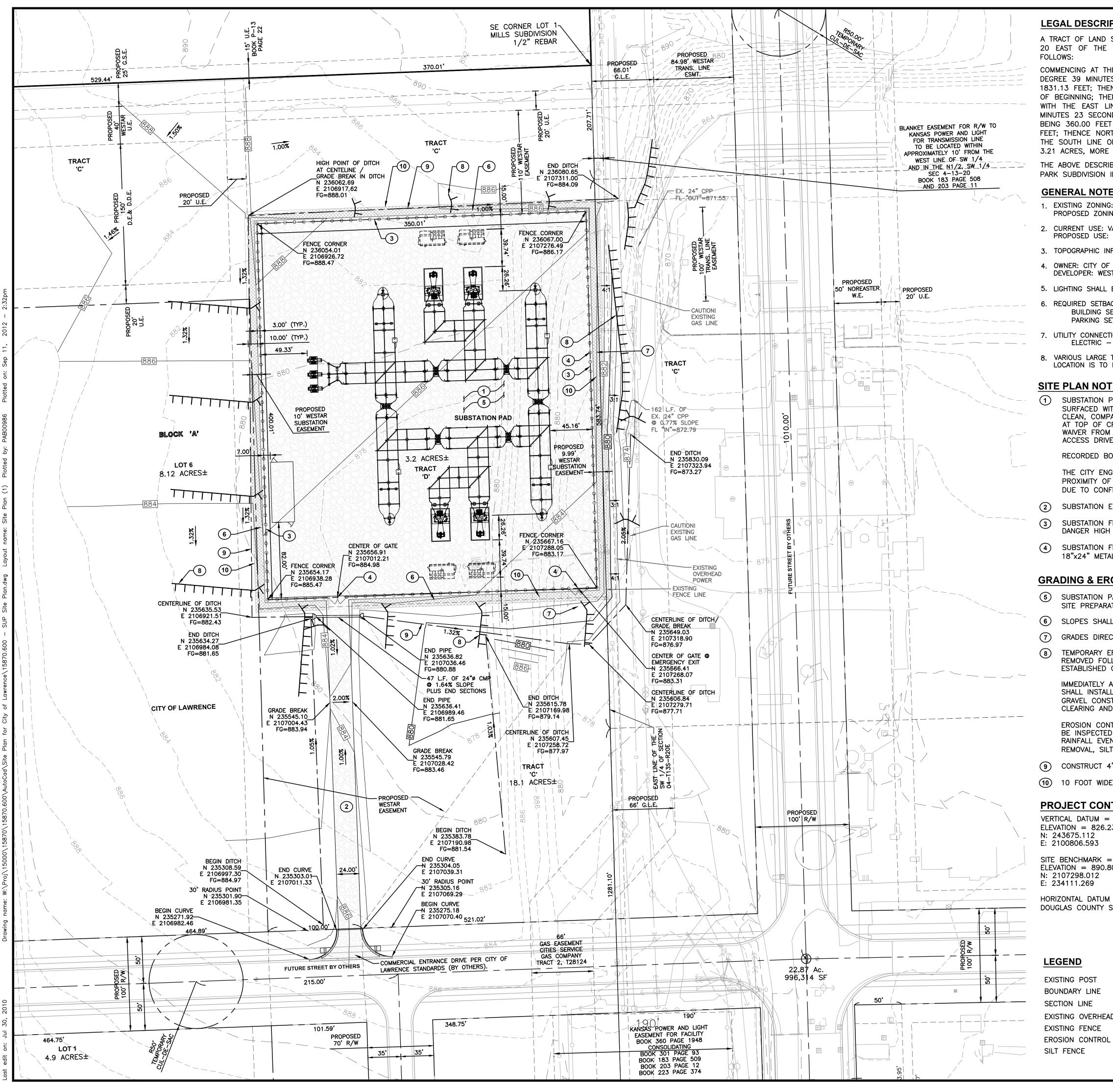
7. WHETHER IT IS APPROPPRIATE TO PLACE A TIME LIMIT ON THE PERIOD OF TIME THE PROPOSED USE IS TO BE ALLOWED BY SPECIAL USE PERMIT AND, IF SO WHAT THAT TIME PERIOD SHOULD BE.

Time limits are established on Special Use Permits to permit a periodic review to determine if the use remains compliant with the area or if a rezoning would be appropriate. An electrical substation is part of necessary infrastructure whose life span will be determined by demand and operational characteristics. It would not be appropriate to place a time limit on this use.

Staff Finding – The project provides necessary infrastructure for surrounding developments; therefore, it would not be appropriate to place a time limit on this use.

Conclusion

The proposed substation will have a positive impact on the area by improving electrical services in the area and to maintain a high level of service. The relocation permits the development of a safe, new signalized entrance to the proposed business park and the ability to create greenway amenities at the entrance. The use is compatible with, and appropriate for, this location and staff recommends approval of the Special Use Permit with the condition noted.



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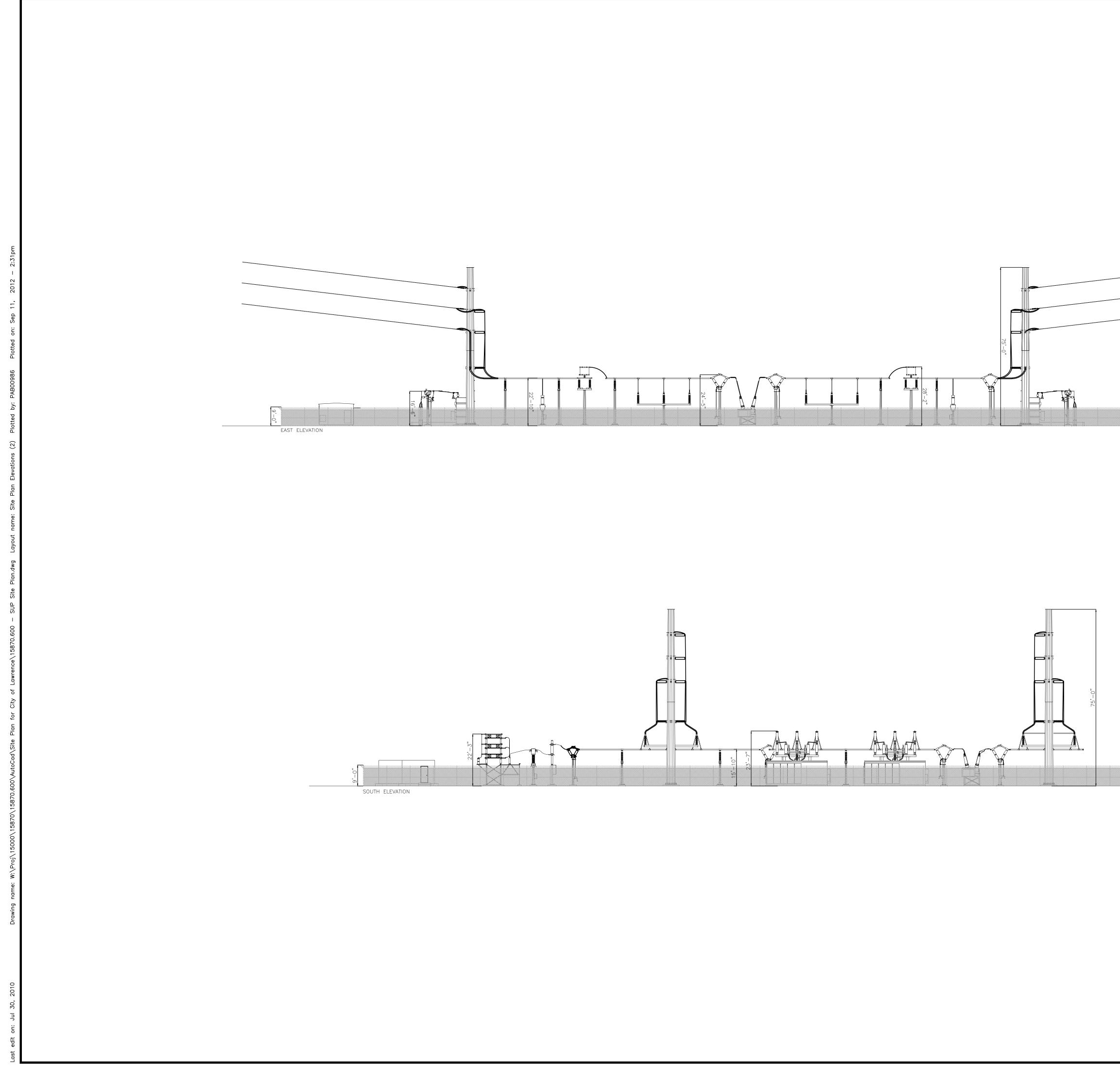
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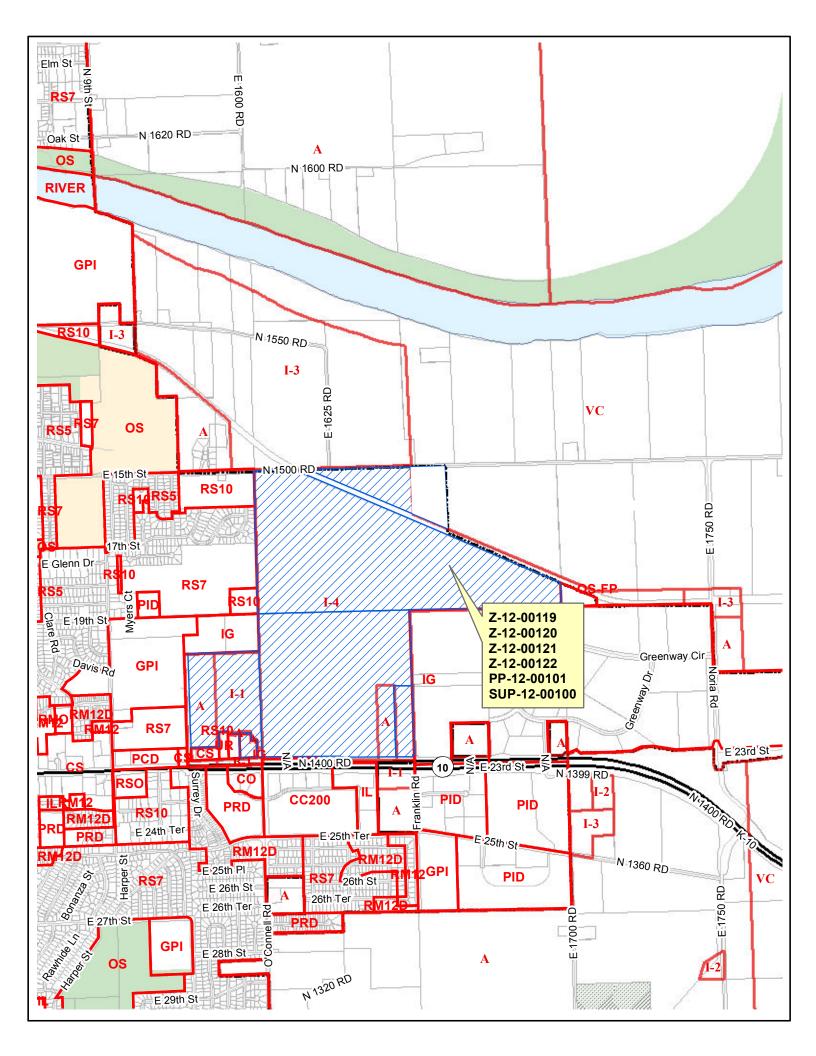
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FORMATION PROVIDED BY BARTLETT & WEST,		DATE -27-12 -11-12	
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BE LOCATED APPROXIMATELY 3' INSIDE FENC CKS:	E LINE. REFER TO WESTAR FLOOD LIGHT DETAIL.		<u> </u>
ETBACKS – 20' NORTH AND WEST SIDES, 25 TBACKS – 15' NORTH, SOUTH AND WEST SI			ហ
IONS: • TO BE FIELD EVALUATED			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
TRANSMISSION POLES WILL BE ADDED IN PRO BE DETERMINED.	DPOSED WESTAR EASEMENTS IN THE FUTURE. EXACT SIZ	E AND	E K8 6 3.749.6
TH A 4" LAYER OF COMPACTED KDOT TYPE ACTED CRUSHED ROCK. PROPOSED CONTO RUSHED ROCK IN PAD AND ENTRANCE DRI THE MINIMUM PAVING STANDARDS HAS BE	3.0' BEYOND THE FENCE. SUBSTATION PAD TO BE AB3 CRUSHED ROCK AND A 4" LAYER OF 1.5" DIA JRS AND SPOT ELEVATIONS REPRESENT FINISHED GRA VE AREAS AND TOP OF GROUND OUTSIDE PAD AREAS EN GRANTED BY THE PLANNING DIRECTOR FOR THE /EEN THE CITY OF LAWRENCE AND WESTAR ENERGY.		DLUMBIA DRIVE - LAWRENG
SINEER GRANTED A WAIVER FROM THE REQ	JIREMENTS OF 20–915(e)(2)(iii) REGARDING THE TION OF (EAST-WEST STREET & NORTH-SOUTH STREE ONS AND THE LIMITED USE ANTICIPATED.		544 GOLUM PHONE 78
INTRANCE TO BE SURFACED WITH 6" COMF	ACTED KDOT TYPE AB3 CRUSHED ROCK.		
ENCE TO BE 8' HIGH BLACK CHAIN LINK VOLTAGE SIGN EVERY 150 FEET ON FENC	FENCE PLUS 3 STRANDS BARB WIRE. PLACE 14"x22" E.		-
ENCE GATE TO BE A 20' WIDE DOUBLE-S	WING GATE CENTERED ON ENTRANCE DRIVE. PLACE O	NE	
	(NOTE: FG INDICATES FINISH GRADE)		
	N FILL AND SHALL CONFORM TO WESTAR ENERGY'S		
TION SPECIFICATIONS (SCS3.REV1) . L TIE IN TO EXISTING GROUND AT 3:1 SLO	PES MAXIMUM WHERE SHOWN		СĔ
CTLY IN FRONT OF EMERGENCY EXITS SHAL			TION AWREN
	S INSTALLED AS PART OF THIS PLAN SHALL NOT BE STABILIZED TO A NON-EROSIVE STATE WITH	ZA	STA FL
L THE PERIMETER EROSION AND SEDIMENT	NG ANY SOIL DISTURBING ACTIVITIES, THE CONTRACTON CONTROL MEASURES OF THE PERIMETER SILT FENCE EDIMENT BASIN(S). IT IS RECOGNIZED THAT SOME SIT PERLY INSTALL SUCH MEASURES.	<u>,</u> C	AR EN ND SU E CITY SOUNT
AND MAINTAINED BY THE CONTRACTOR NO	BARRIERS AND TEMPORARY SEDIMENT BASIN(S) SHA DT LESS THAN WEEKLY OR WITHIN 24 HOURS AFTER DE SHALL INCLUDE BUT NOT LIMITED TO SEDIMENT ND/OR REPLACEMENT.		WEST FAIRGROU TED IN THE
' WIDE BOTTOM DITCH, SIDE SLOPES VARY E EROSION CONTROL BLANKET (LANDLOCK	AS SHOWN (REFER TO SECTION 'A—A' SHEET 5). 407)		FAIR LOCATED DOUG
TROL	SITE SUMMARY		
NGS BM #M368 3 FEET (NAVD-88)	EXISTING SITE SUMMARYEXISTING BUILDING:0 S.F. (0.1EXISTING PAVEMENT:0 S.F. (0.1	00 AC.)	
	EXISTING PAVEMENT: 0 S.F. (0.1 TOTAL IMPERVIOUS: 0 S.F. (0.1 EXISTING PERVIOUS: 140,007.50 S.F. (3.1		
PT#1045 (SQ. CUT ON INLET) 0	EXISTING PERVIOUS: 140,007.50 S.F. (3. TOTAL AREA: 140,007.50 S.F. (3.)		
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= SECTION CORNER NETWORK (NAD-83)	PROPOSED BLDG:0 S.F. (0PROPOSED PAVEMENT:0 S.F. (0PROPOSED INDEDWOUS:0 S.F. (0	.00 AC.)	
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	SCALE: 1" =	50' SHEET NO:	1 of 2



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	SITE PLAN ELEVATIONS	WESTAR ENERGY FAIRGROUND SUBSTATION LOCATED IN THE CITY OF LAWRENCE, DOUGLAS COUNTY, KANSAS
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SITE PLAN ELEVATIONS	SCALE: DATE: DRAWING N	
0 20' 40'	SHEET NO:	SP-2



Memorandum City of Lawrence Planning & Development Services

TO: David L. Corliss, City Manager

FROM: Scott McCullough, Director

Date: August 13, 2012

RE: Code Review and Text Amendment Initiation

This memo seeks initiation of city code amendments to ensure business-friendly, responsive, and efficient processes for development. Initiation does not adopt any code changes, but does begin the process for review by staff, the Planning Commission and the public for eventual consideration by the City Commission.

The code is constantly under review and revision. Most notably, PDS made significant changes to the Land Development Code in 2009 to reduce the amount of process for minor development projects and infill projects that were not intensifying use. These changes employed input from several stakeholders including the Chamber of Commerce, individual consultants, LAN, and professional staff.

More recently, utility standards were revised to streamline variance procedures, a reciprocal licensing agreement was reached between the city and Johnson County to the benefit of contractors, and streamlining the sidewalk dining hearing procedures are in process.

In order to continue to seek improvements to enable and encourage development while ensuring that such development continues to enhance neighborhoods, staff has reviewed the standards and processes of certain sections of the City Code and provides these recommendations for revisions with the goal of continually improving the development process.

Code Standard or Processing Issue	Discussion of Standard or Process	Status
 Review requirement for Photometric Plan for all but Outdoor Recreation Lighting 	A photometric plan is a study of the light transmitted onto the subject and adjacent properties from any outside light source on projects that require site planning. The study conveys evidence that the maximum light levels of the code are not exceeded. The study can be time consuming and costly for an applicant. The value of the study could be	Proposed – requires City Commission initiation of revisions to the Land Development Code.

2.	Review the requirement for a Retail Market Study to be submitted with zoning and site plan applications	maintained by prescribing a level of code standards for outdoor lighting in lieu of the study. For example, standards related to the height of parking lot poles, bulb wattage, setback from property line, etc. can ensure low light impact to adjacent neighbors while lessening the burden on applicants. The code requires that a retail market study be submitted for any proposal that includes 50,000 square feet of retail uses. This is intended to ensure a healthy retail market as development occurs in the city. Planning Staff maintains a bi-annual retail market study that provides valuable information about the overall health of the retail market. While specific market studies can provide important information about a project's potential impact on the market as well, the requirement to provide a study in addition to the one completed by staff is viewed by some as costly and time consuming when a prudent analysis of any proposal can be made with the information contained in staff's study.	Proposed – requires City Commission initiation of revisions to <i>Horizon 2020</i> and the Land Development Code.
3.	Review the requirement that development projects be required to comply with <i>Horizon 2020</i>	For rezoning applications, the Development Code requires compliance with <i>Horizon 2020</i> , yet the state statutes and case law views the comprehensive plan as a guide document. Removing the requirement for comprehensive plan compliance for rezoning requests would streamline the application process while maintaining the integrity of the adopted plans as one of the Golden Factors by which to analyze a request.	Proposed – requires City Commission initiation of revisions to the Land Development Code.
4.	Review parking lot screening standards	The code related to parking lot perimeter screening currently requires a solid masonry wall between 3 and 4 feet in height or a berm. The wall can prove costly and a berm requires a wide area to accommodate the 3:1 slope. Consider revising the standards to lessen the amount of screening required (hedge of shrubs for example).	Proposed – requires City Commission initiation of revisions to the Land Development Code.
5.	Review the right- of-way variance process	The code requires that variances associated with reducing rights-of-way widths when platting be approved by the Planning Commission. This is less of an issue with the major platting process, but can add time to an otherwise time-efficient minor subdivision process. Consider a more streamlined	Proposed – requires City Commission initiation of revisions to the Subdivision Regulations.

		mechanism to grant the variance for minor subdivisions – City Engineer approval, for example.	
6.	Review the Master Street Tree Plan process	The Master Street Tree Program ensures that street trees are planted with any new subdivision. Replatting through the minor subdivision process can alter the number of trees assigned to individual lots, thus requiring revisions to the street tree plan. Staff believes efficiencies in process can occur with a review of the program.	Proposed – requires City Commission initiation of revisions to the Subdivision Regulations.
7.	Review the notice for easement and right-of-way dedication and vacation on minor subdivisions	Dedicating and/or vacating easements and rights-of-way can be accomplished with the minor subdivision process with a 20-day notice period to surrounding property owners prior to City Commission consideration. Staff believes efficiencies can be made in the notice requirement that would maintain notice to surrounding property owners, but that could reduce the overall time required to submit the application to the City Commission.	Proposed – requires City Commission initiation of revisions to the Subdivision Regulations.

Action Requested: Initiate the recommended text amendments noted above to the various sections of the City Code.



LEAGUE OF WOMEN VOTERS® OF LAWRENCE/DOUGLAS COUNTY

Lawrence/Douglas County Planning Commission

RE: MISC NO. 1 TEXT AMENDMENT INITIATION

your agenda this month as Miscellaneous Item 1.

League of Women Voters of Lawrence/Douglas County

Dear Chairman Liese and Commissioners:

RECEIVED

SEP 24 2012

City County Planning Office Lawrence, Kansas

President **Melinda Henderson** September 24, 2012

Lawrence KS 66044

City Hall

President-Elect **David Burress**

Vice President **Milton Scott**

Secretary **Caleb Morse**

Treasurer Marjorie Cole

Directors Margaret Arnold

Bonnie Dunham

James Dunn

Sally Hayden

Cille King

Ruth Lichtwardt

Marlene Merrill

PO BOX 1072 • LAWRENCE KS 66044-1072 league@sunflower.com • www.lawrenceleague.com www.facebook.com/lwvldc • www.twitter.com/lwvldc

In our letter to the City Commission, we addressed concerns about two specific amendments (Revisions #2 and #3), which we discuss in detail in the attached letter. While our preference would be for you to not initiate these two particular amendments,

Attached, for your review, is a copy of a letter we sent to the City Commission on August 19, 2012. This letter addressed the initiation of several text amendments which are on

should you go ahead and do so, we look forward to providing input about them as they move through the review process.

Thank you for your work serving the city and the county as Planning Commissioners.

Yours truly,

Melinda Henderson, President

League of Women Voters of Lawrence-Douglas County P.O. Box 1072, Lawrence, Kansas 66044

August 19, 2012

RECEIVED

Mr. Bob Schumm, Mayor Lawrence City Commissioners City Hall Lawrence, KS 66044

CITY MANAGERS OFFICE LAWRENCE, KS

RE. CONSENT AGENDA NO. 9, CODE REVIEW AND TEXT AMENDMENT INITIATION

Dear Mayor Schumm and City Commissioners:

On behalf of public concern, the League asks that Item No. 9 be removed from the Consent Agenda and opened for discussion.

This Memorandum is asking the City to initiate seven Land Development Code and *Horizon 2020* changes that would radically change our land use planning system in Lawrence. All of the proposals in the Memorandum need to be carefully scrutinized and we ask that you not initiate any of them. Below we have discussed the two proposals that are of <u>most</u> concern to us.

A. <u>Text revision No. 3: "Review the requirement that development projects be required to comply with Horizon 2020."</u> The language further explains, "Removing the requirement for comprehensive plan compliance for rezoning requests would streamline the application process..." This proposal would remove the essential purpose of the comprehensive plan: to be able to plan ahead. It is the means by which through its goals, policies and specific area plans, plus the plans which are also a part of it such as the Transportation Plan, it creates the framework that allows everything in the city to connect appropriately and function properly. Our Land Development Code states as follows:

"20-104 PURPOSE This Development Code is intended to implement the Lawrence/Douglas CountyComprehensive Land Use Plan and other applicable plans adopted by the City Commission, hereinafter collectively referred to as the "Comprehensive Plan" – in a manner that protects, enhances and promotes the health, safety, and general welfare of the citizens of Lawrence."

Removing the mandatory compliance with *Horizon 2020* of zoning applications would eliminate the policies that determine where and when rezoning is appropriate and valid and would create an arbitrary approach to zoning. It would allow zoning decisions to be determined on the basis of opinions rather than facts. It would eliminate the predictability essential for private and public economic and functional decisions.

B. <u>Text Revision No. 2.</u> <u>"Review the requirement for a Retail Market Study to be submitted with zoning and site plan applications.</u>" [Note added: This specifically applies to the 50,000 square foot provision for retail uses.]

Removing this requirement would essentially remove the standard that would trigger a market analysis. These market analyses are important for new business investors as well as for existing business owners who rely on population demand to maintain viable businesses. These are essential tools for our community to maintain a healthy business environment. Predictability is critical in maintaining a well-functioning business environment,

There are other reasons for not changing any of the Comprehensive Plan and Land Development Code provisions as proposed in this Item No. 9, and we ask again that you not initiate any of these text amendments.

Sincerely,

Milton Scott Vice President

Alan Black

Alan Black, Chairman Land Use Committee

LWV8-21-12city commission consent agenda No. 9 changes to H2020 LTR MiltonEd.FINAL.wpd