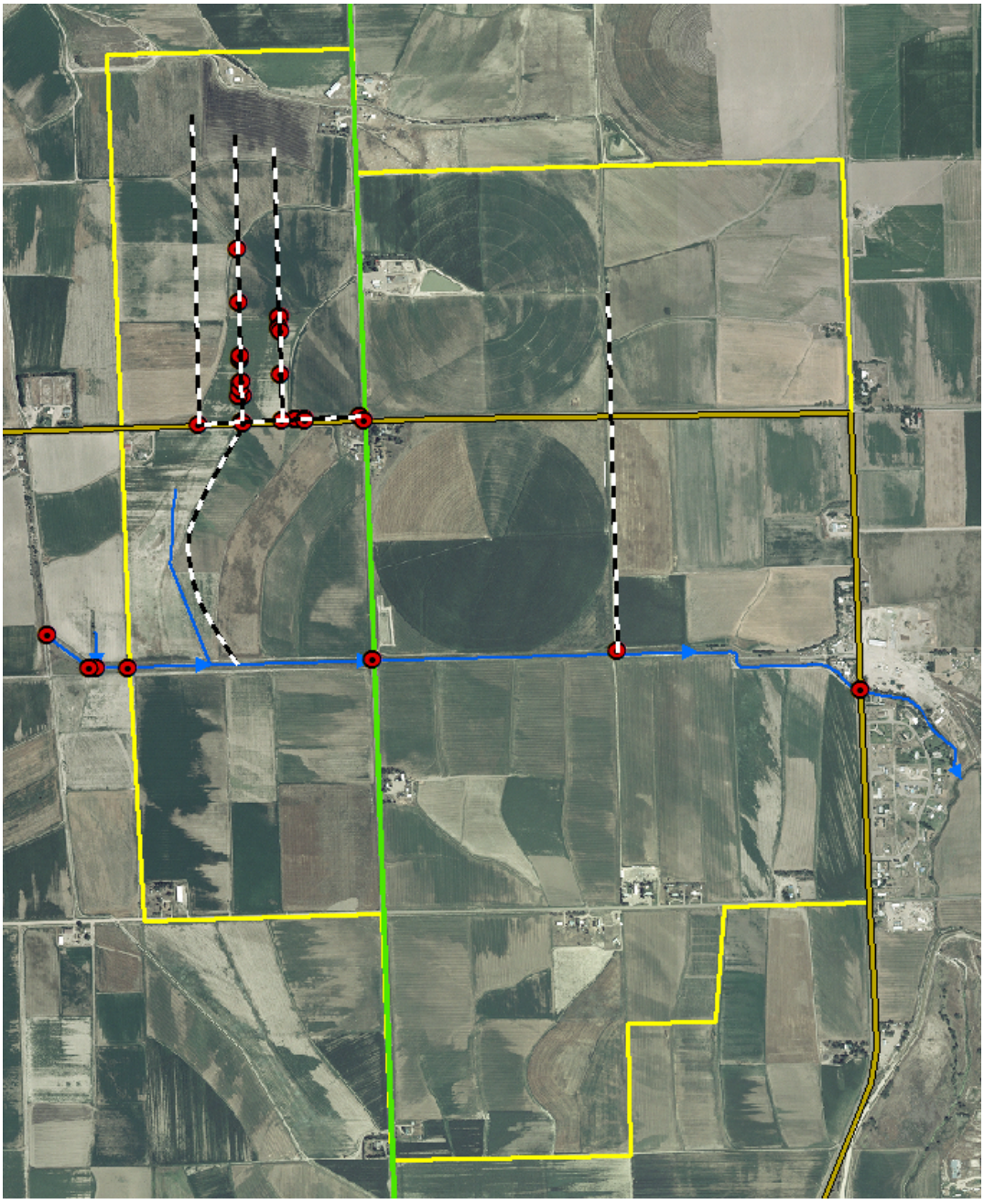
Kornman Drainage District
System Inventory

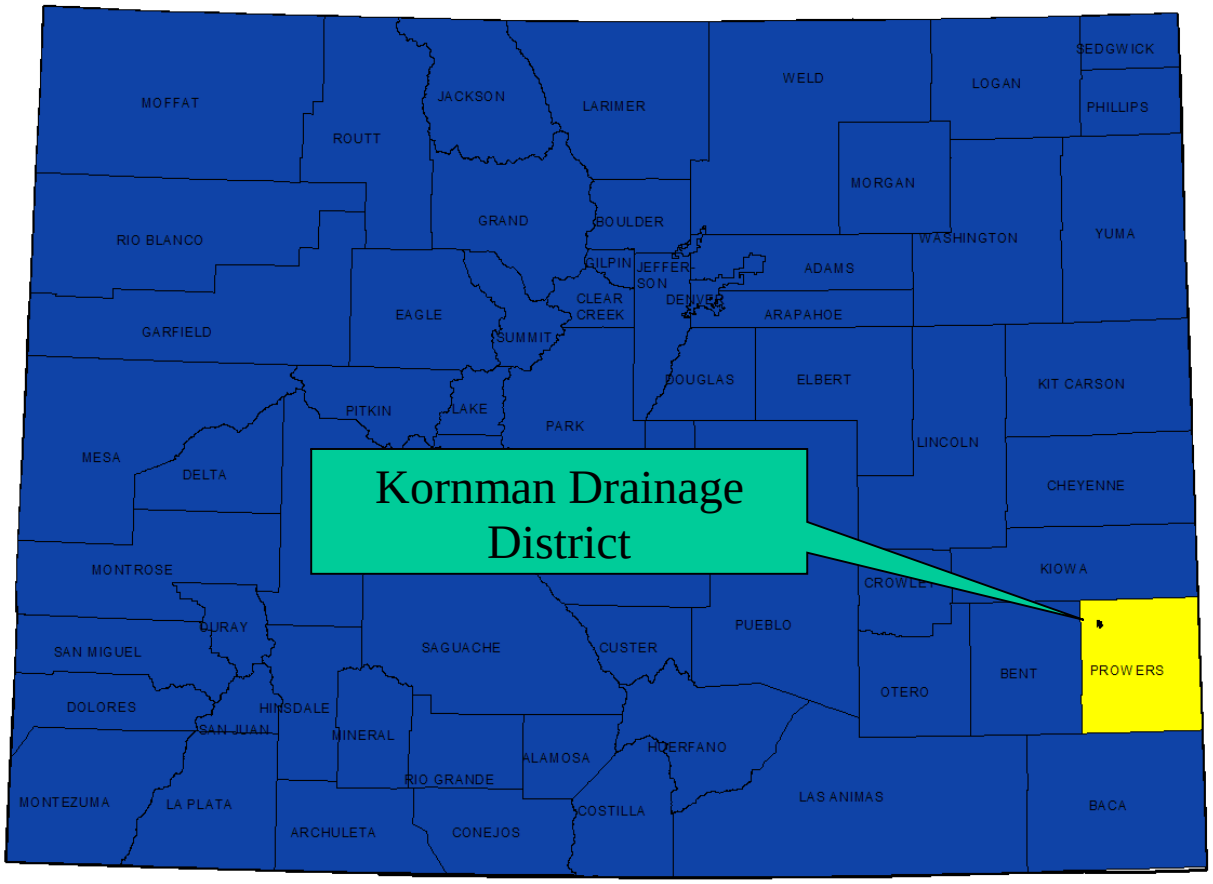


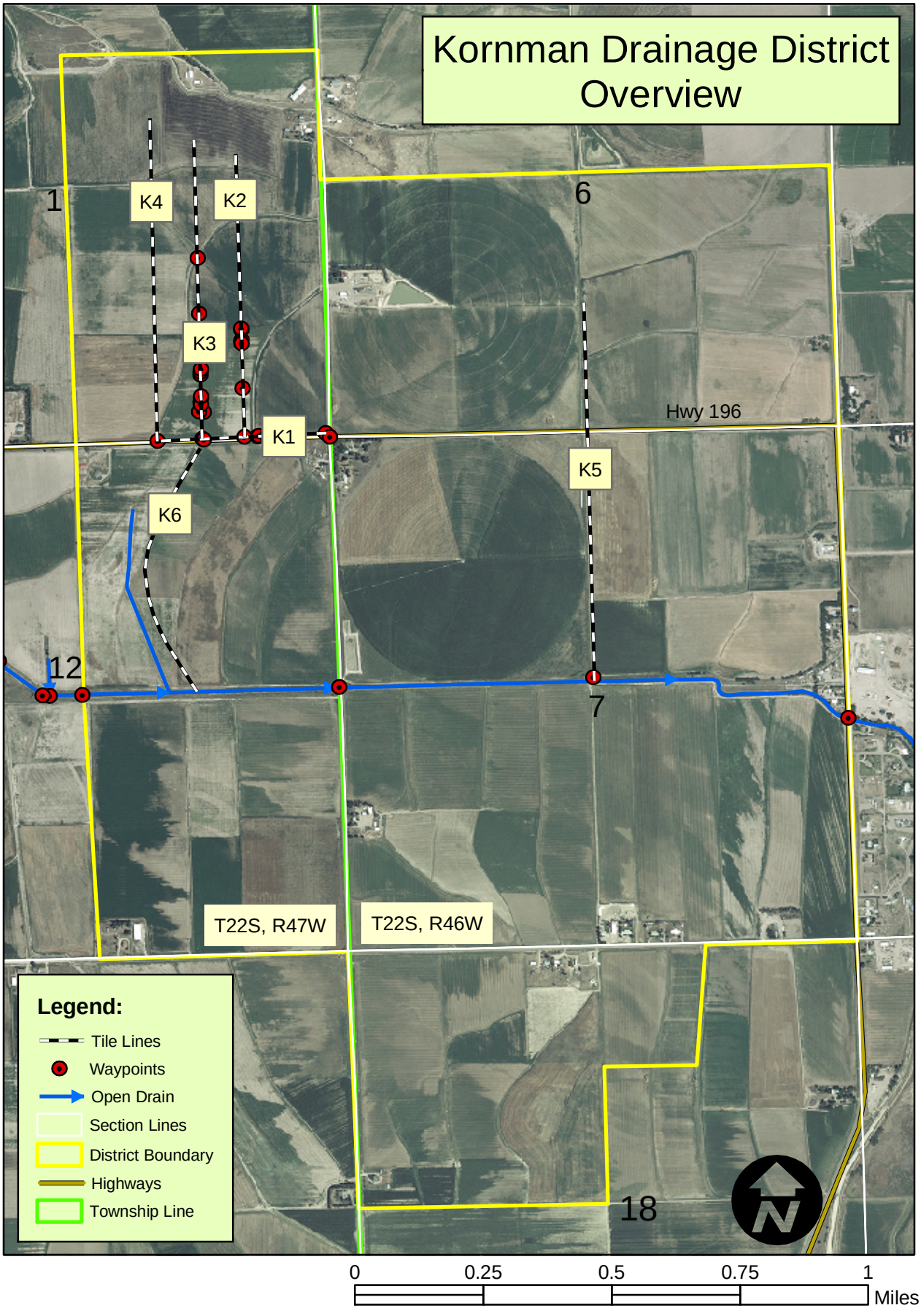
June 15, 2005, Rev. November 20, 2006, January 12, 2007

Prepared with the assistance of Bud Scranton, Kathy Scranton, John Wilkins-Wells and Walter Epley

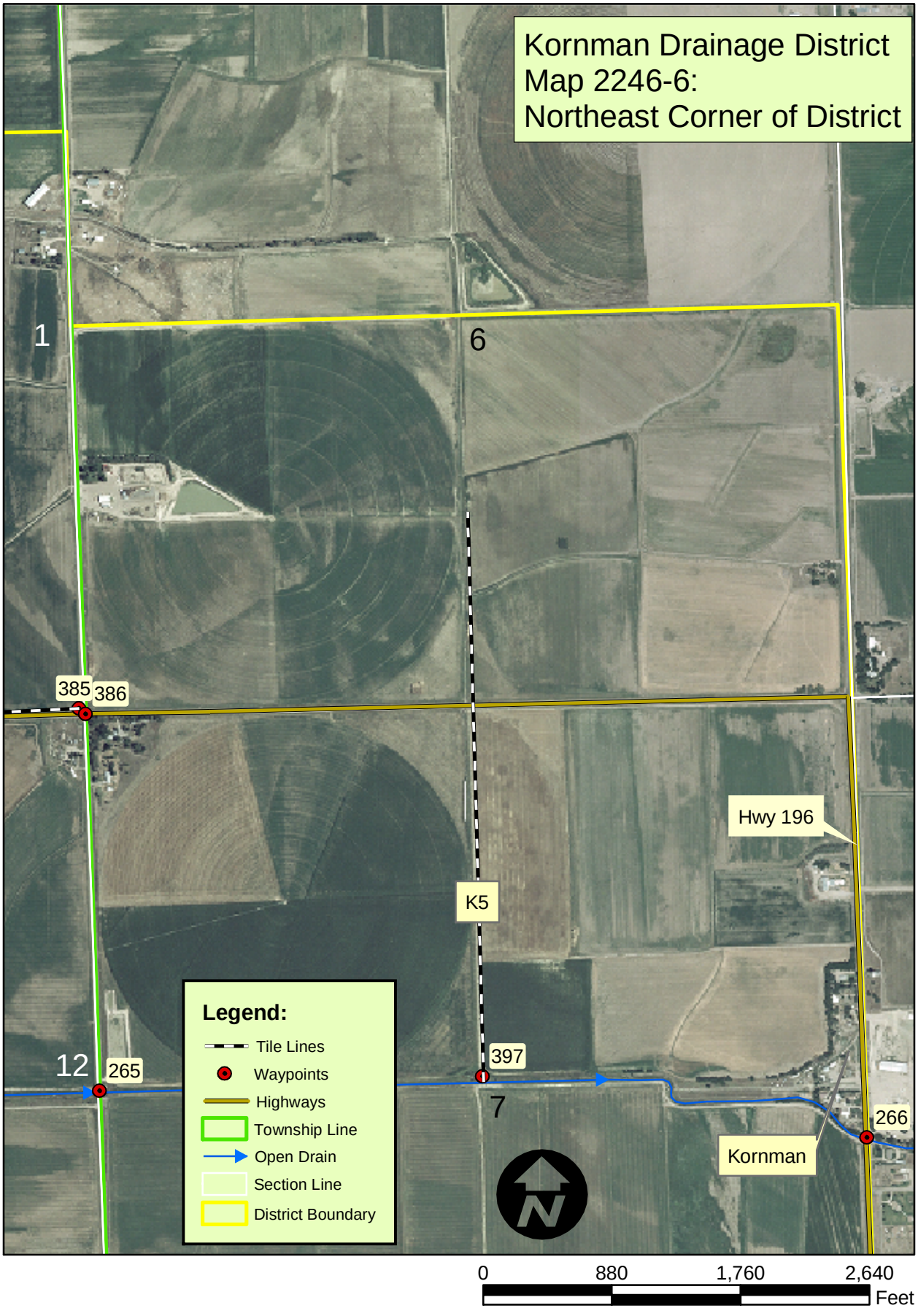
The Lower Arkansas Valley Drainage System Rehabilitation Study
Colorado State Univ., Dr. John Wilkins-Wells, Sociology Water Lab
Clark Building B258, Fort Collins, CO 80523 Ph: 970-491-5635

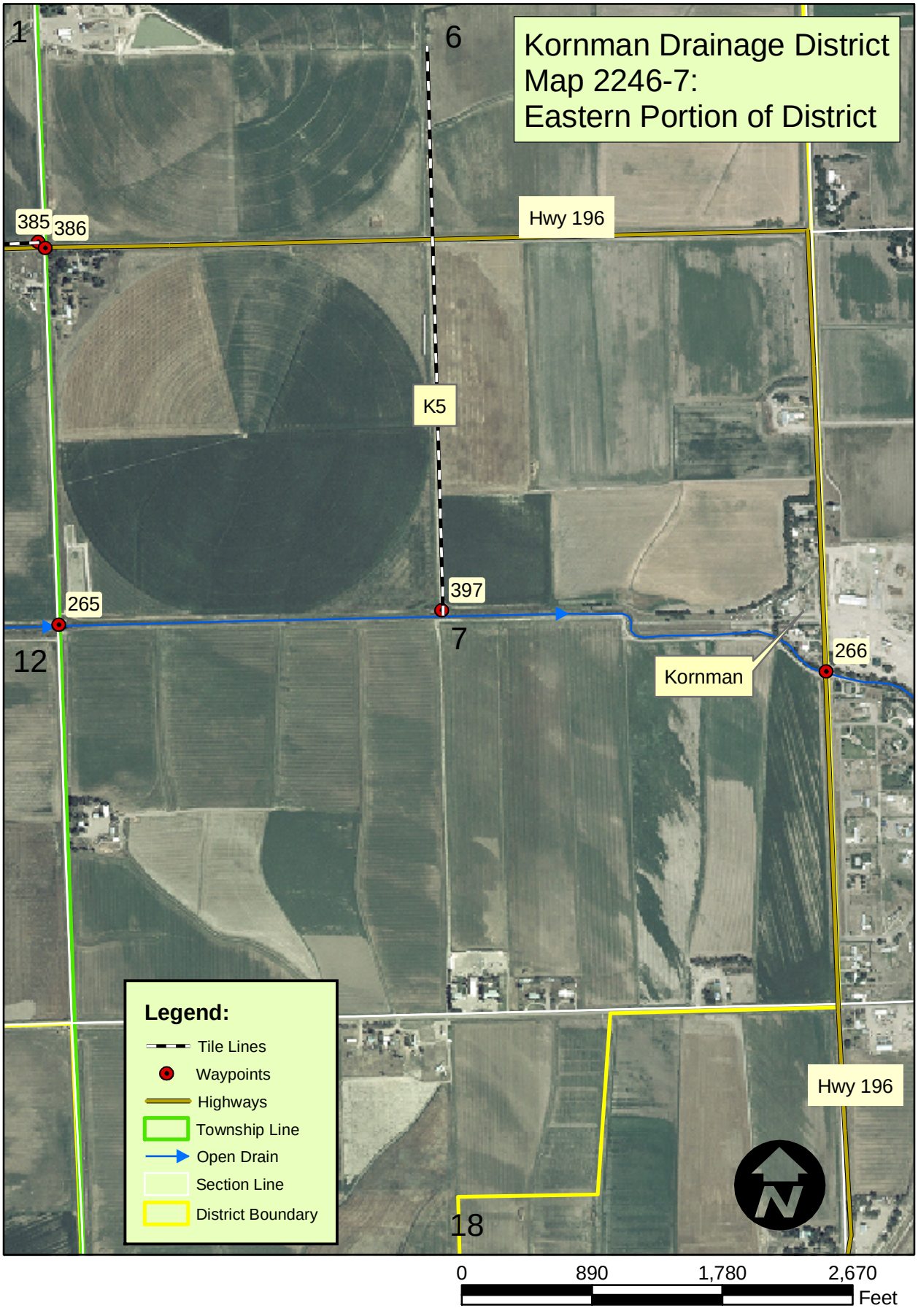
Location of Kornman Drainage District In Colorado And Prowers County

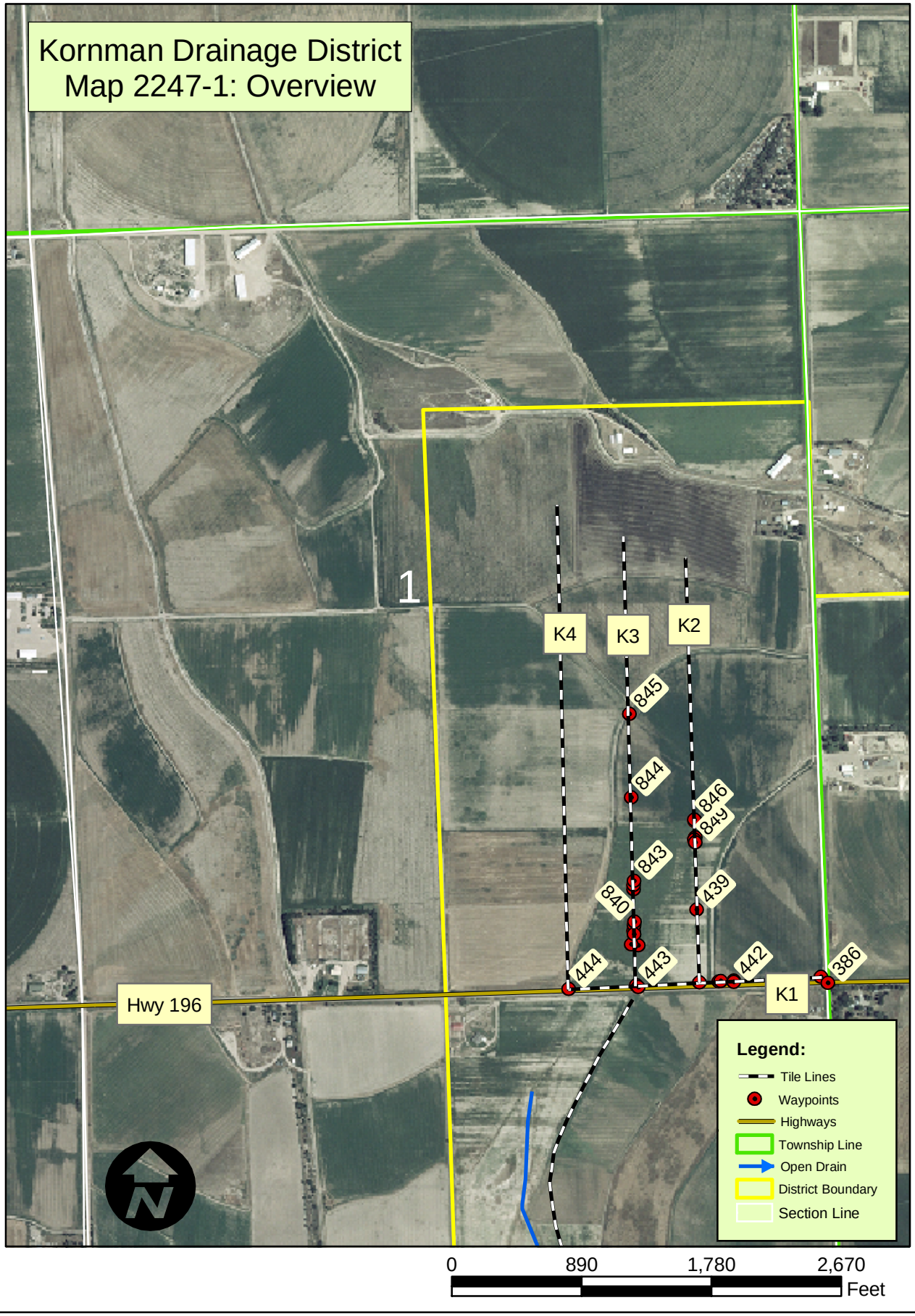



Kornman Drainage District Overview
1
6
12
7
18
K1
K2
K3
K4
K5
K6
Hwy 196
T22S, R47W
T22S, R46W
Legend:
Tile Lines
Waypoints
Open Drain
Section Lines
District Boundary
Highways
Township Line
0
0.25
0.5
0.75
1
Miles

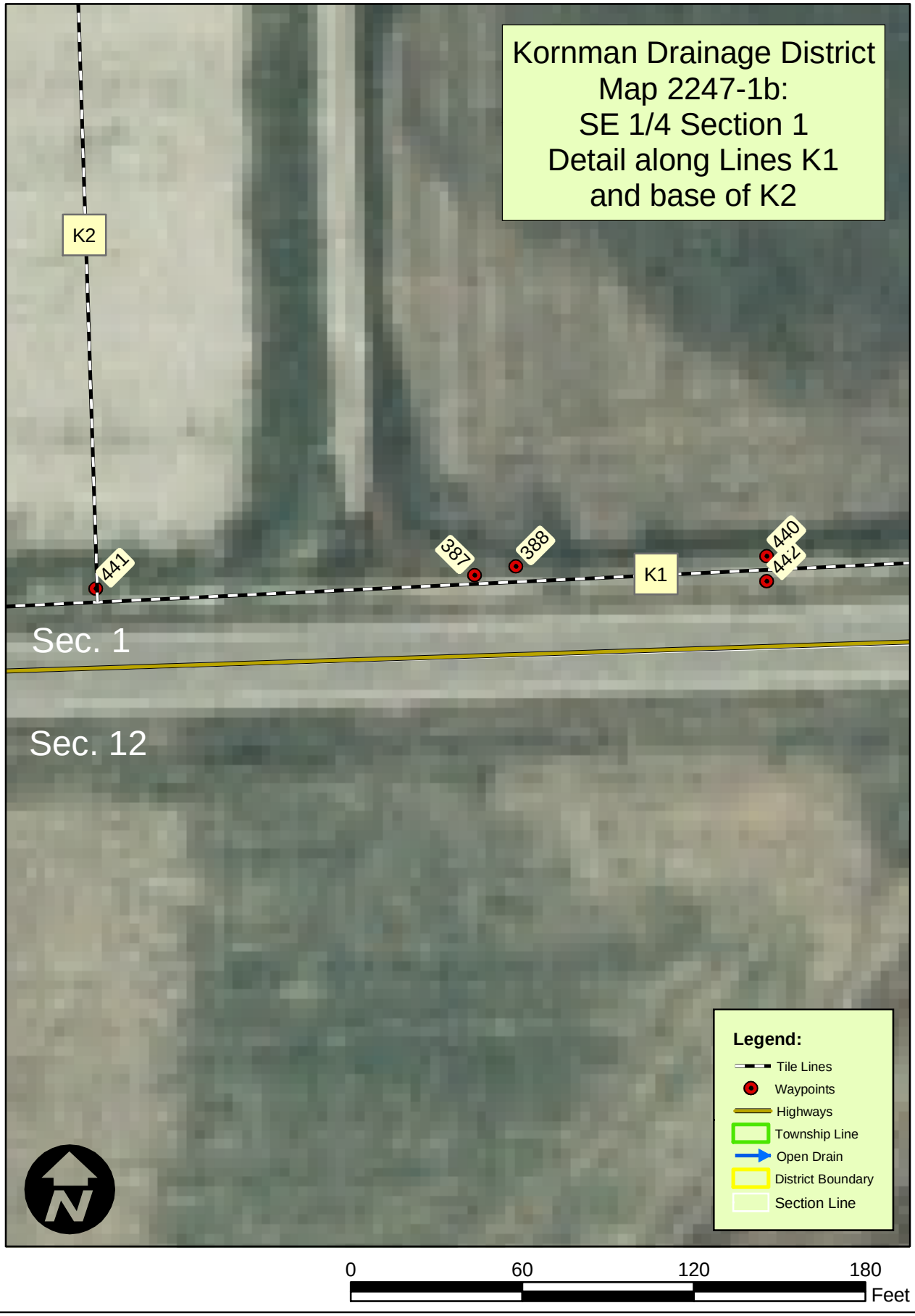
TOWNSHIP #	SECTION #	SECTION OVERVIEW MAP DESIGNATION	ADD'L PAGES (greater detail)
T22S, R46W Prowers County	6	2246-6	none
	7	2246-7	none
T22S, R47W Prowers County	1	2247-1	a,b,c,d,e,f
	12	2247-12	a,b

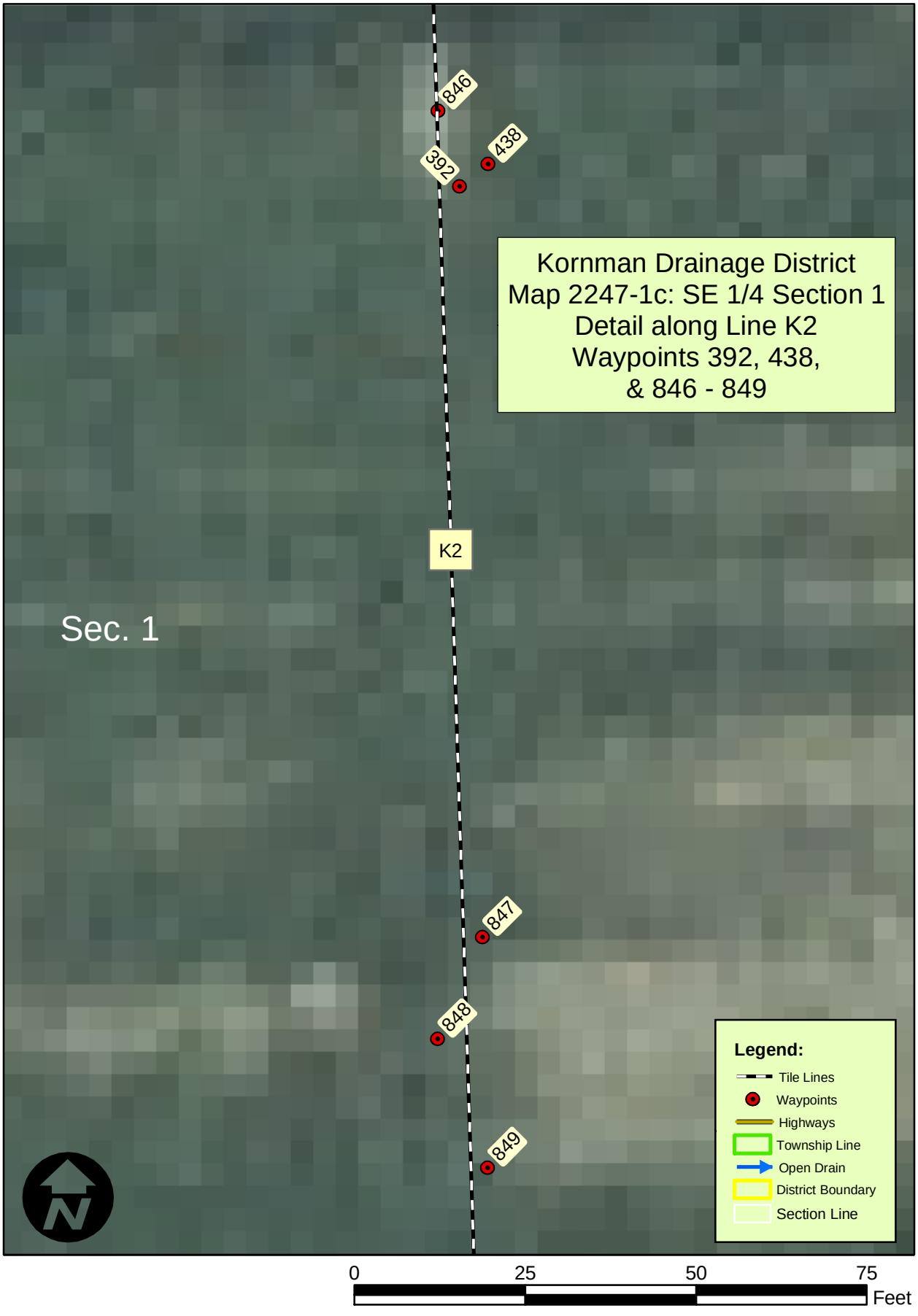

Kornman Drainage District
Map 2246-6:
Northeast Corner of District
1
6
385
386
Hwy 196
K5
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
Section Line
District Boundary
12
265
397
7
266
Kornman
N
0
880
1,760
2,640
Feet


Kornman Drainage District
Map 2246-7:
Eastern Portion of District
1
6
Hwy 196
385
386
K5
397
265
7
12
266
Kornman
Hwy 196
18
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
Section Line
District Boundary
0
890
1,780
2,670
Feet

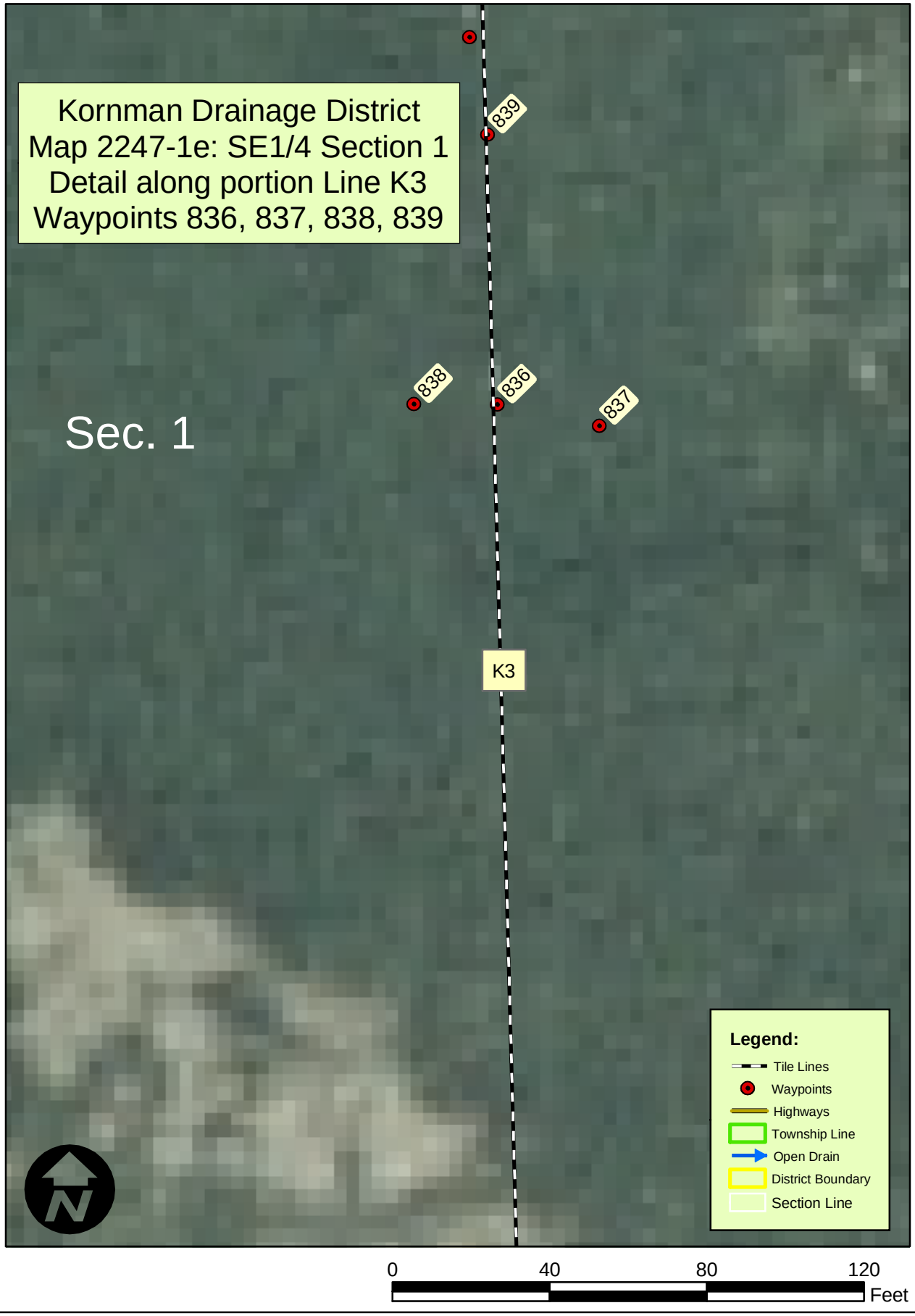

Kornman Drainage District
Map 2247-1: Overview
1
K4
K3
K2
K1
845
844
846
849
843
840
439
444
443
442
386
Hwy 196
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
District Boundary
Section Line
0
890
1,780
2,670
Feet


Kornman Drainage District
Map 2247-1a:
Detail at intersection
of Hwy 196 & CR 7
Sec. 1
Sec. 6
Sec. 12
Sec. 7
385
386
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
District Boundary
Section Line
0
150
300
450
Feet

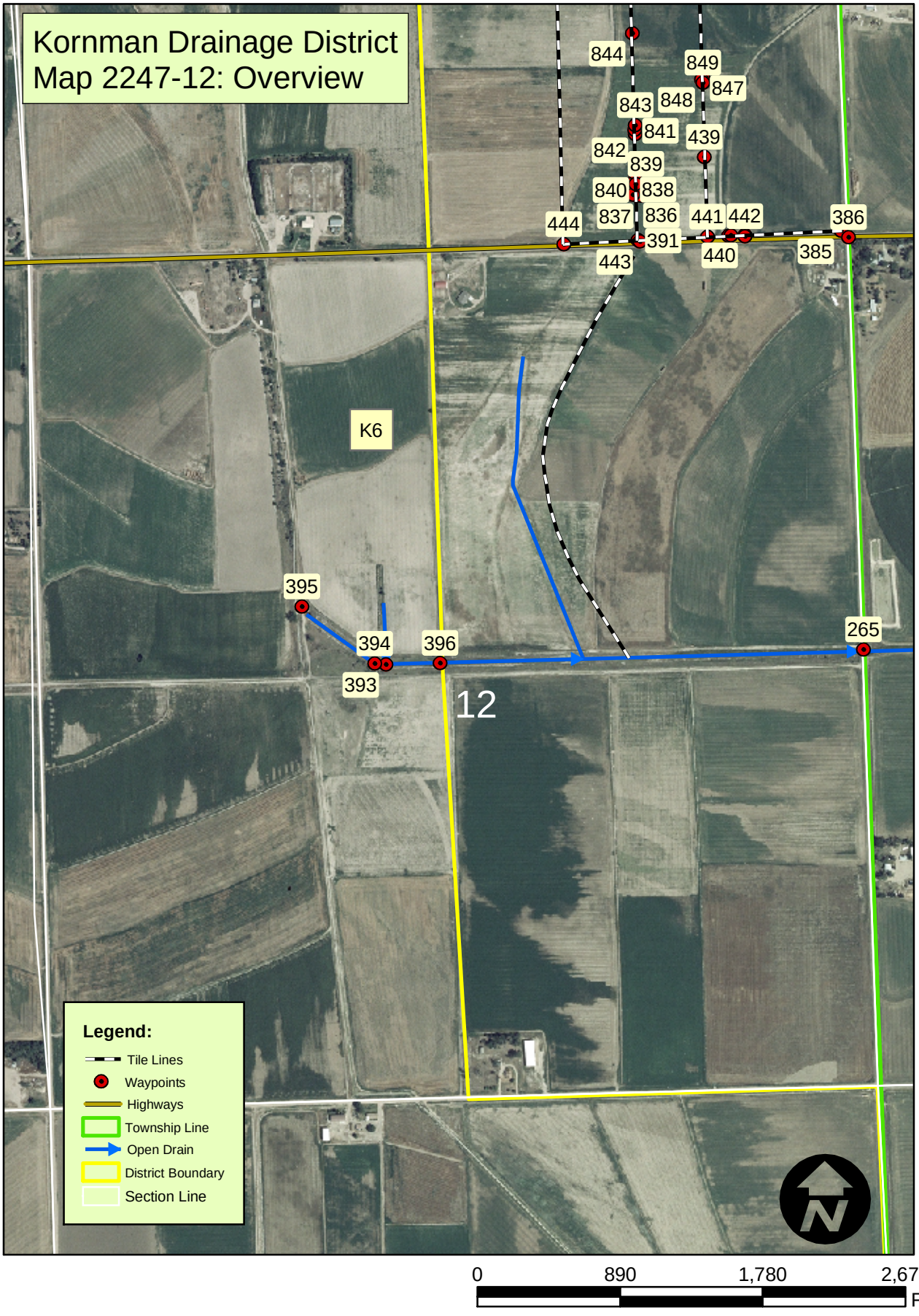

Kornman Drainage District
Map 2247-1b:
SE 1/4 Section 1
Detail along Lines K1
and base of K2
K2
K1
441
387
388
440
442
Sec. 1
Sec. 12
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
District Boundary
Section Line
N
0
60
120
180
Feet

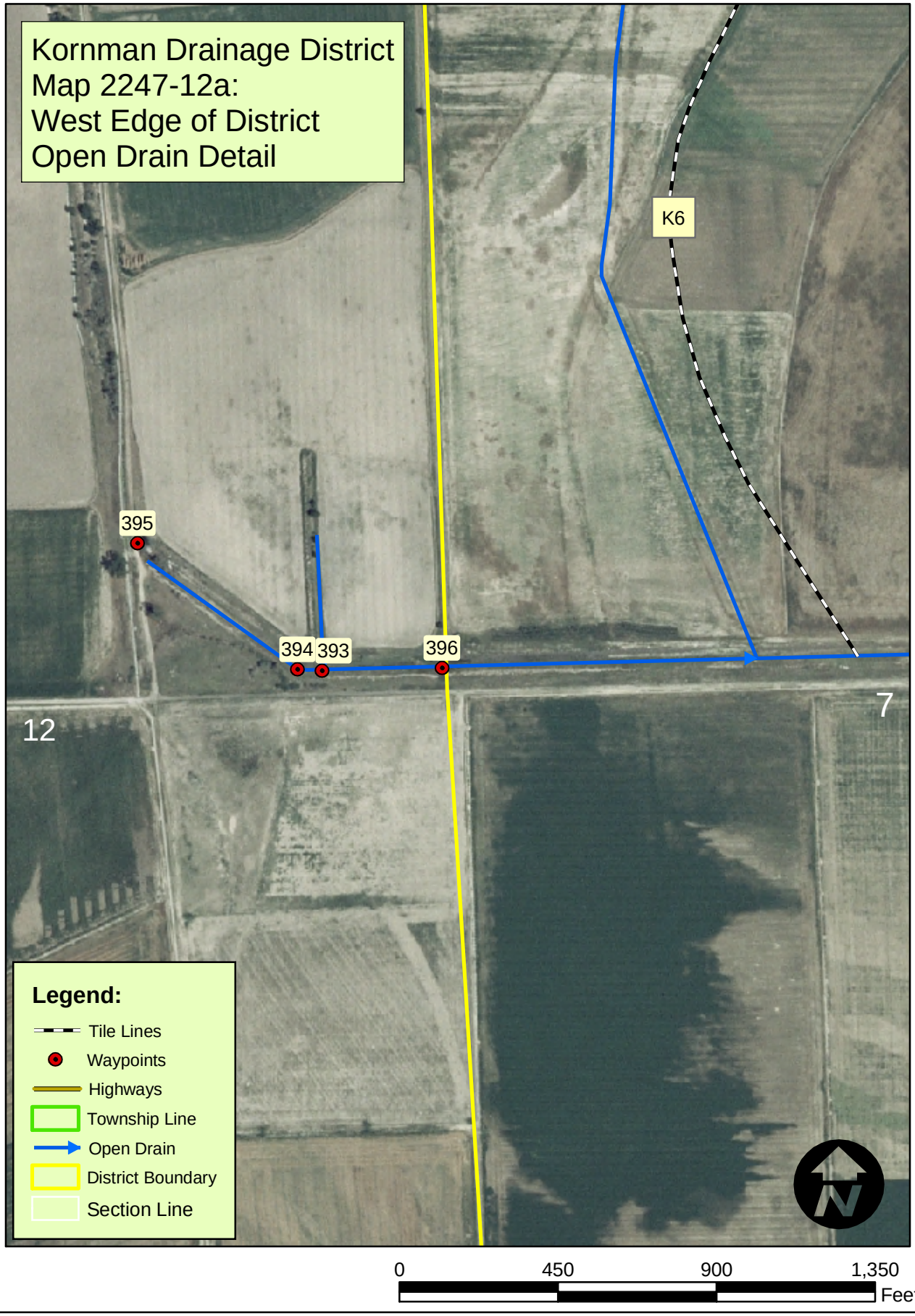

Kornman Drainage District
Map 2247-1c: SE 1/4 Section 1
Detail along Line K2
Waypoints 392, 438,
& 846 - 849
846
438
392
K2
Sec. 1
847
848
849
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
District Boundary
Section Line
N
0
25
50
75
Feet

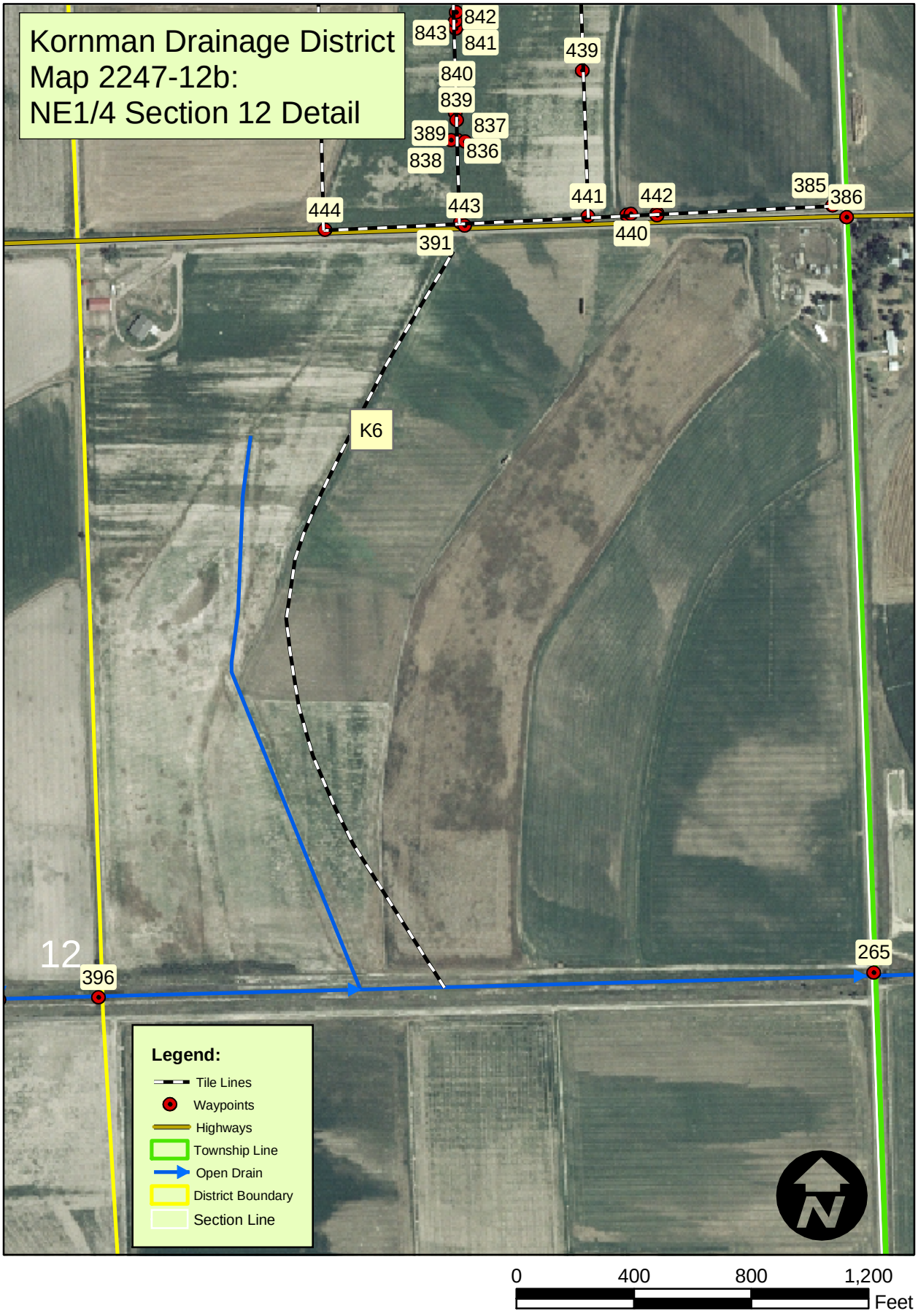

Kornman Drainage District
Map 2247-1d: SE1/4 Section 1
Detail along intersections
of Lines K1, K2, & K3
839
838
837
K3
K2
Sec. 1
441
391
443
K1
K6
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
District Boundary
Section Line
0
120
240
360
Feet


Kornman Drainage District
Map 2247-1e: SE1/4 Section 1
Detail along portion Line K3
Waypoints 836, 837, 838, 839
Sec. 1
839
838
836
837
K3
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
District Boundary
Section Line
0
40
80
120
Feet


Kornman Drainage District
Map 2247-1f: SE1/4 Section 1
Detail along portion Line K3
K3
843
842
841
Sec. 1
840
390
389
839
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
District Boundary
Section Line
0
80
160
240
Feet


Kornman Drainage District
Map 2247-12: Overview
844
849
847
848
843
841
439
842
839
840
838
837
836
441
442
386
444
391
440
385
443
K6
395
394
396
265
393
12
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
District Boundary
Section Line
N
0
890
1,780
2,670
Feet


Kornman Drainage District
Map 2247-12a:
West Edge of District
Open Drain Detail
K6
395
394
393
396
12
7
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
District Boundary
Section Line
N
0
450
900
1,350
Feet


Kornman Drainage District
Map 2247-12b:
NE1/4 Section 12 Detail
842
843
841
439
840
839
837
389
836
838
385
386
444
443
441
442
391
440
K6
12
396
265
Legend:
Tile Lines
Waypoints
Highways
Township Line
Open Drain
District Boundary
Section Line
N
0
400
800
1,200
Feet

Wypt.	Type	Sec. Loc'n	Best Shown on Map #:	Also shown on Map #:	Also shown on Map #:	Also shown on Map #:
265	DitchRdCro	7, 12	2246-7	2247-12	2247-12b	
266	DitchRdCro	7, 1	2246-7	2246-6		
385	TileOutlet	1	2247-1a	2246-7	2246-6	2247-12b
386	FieldObs	1,6,7,12	2247-1a	2247-1	2246-6	2247-12b
387	TileLoc	1	2247-1b			
388	TileLoc	1	2247-1b			
389	Repairscar	1	2247-1f			
390	Repairscar	1	2247-1f			
391	TileLoc	1	2247-1d	2247-12b	2247-12	
392	Repairscar	1	2247-1c			
393	OpenDitch	12	2247-12a	2247-12		
394	OpenDitch	12	2247-12a	2247-12		
395	OpenDitch	12	2247-12a	2247-12		
396	OpenDitch	12	2247-12a	2247-12	2247-12b	
397	TileOutlet	7	2246-7	2246-6		
438	Repairscar	1	2247-1c			
439	Sinkhole	1	2247-1	2247-12b		
440	TileLoc	1	2247-1b	2247-12b	2247-12	
441	TileLoc	1	2247-1b	2247-1d	2247-12	2247-12b
442	TileLoc	1	2247-1b	2247-12	2247-12b	
443	Repairscar	1	2247-1d	2247-1	2247-12b	2247-12
444	FieldObs	1	2247-1	2247-12b	2247-12	
836	Sinkhole	1	2247-1e			
837	Sinkhole	1	2247-1e	2247-1d		
838	Sinkhole	1	2247-1e	2247-1d	2247-12b	
839	Sinkhole	1	2247-1e	2247-1f	2247-1d	2247-12b
840	Sinkhole	1	2247-1f	2247-1	2247-12b	
841	Sinkhole	1	2247-1f	2247-12b		
842	Sinkhole	1	2247-1f	2247-12b		
843	Sinkhole	1	2247-1c	2247-1	2247-12b	
844	FieldObs	1	2247-1			
845	FieldObs	1	2247-1			
846	Sinkhole	1	2247-1c	2247-1		
847	Sinkhole	1	2247-1c			
848	Sinkhole	1	2247-1c			
849	Sinkhole	1	2247-1c	2247-1		

Drainage District Infrastructure notes on the Kornman Drainage District located in Prowers County, Colorado. This district includes all or parts of Sections 1 & 12 of T22S, R47 W, and Sections 6, 7, & 18 of T22S, R46W in Prowers County, Colorado.

Waypoints and notes taken on March 10, 2005, May 14th and 23rd, and November 13, 2006. We used the Garmin GPSmap76 handheld unit with a backpack differential correction unit to locate the waypoints. Waypoints taken in November, 2006 were in response to the appearance of recent sinkholes developed during the summer of 2006. Waypoints and notes done with the help of Bud Scranton, Kathy Scranton, John Wilkins-Wells, and Walter Epley. We also had the assistance of Susan Hansen and Kyle Wait of the USDA NRCS office in Lamar for the locations of the sinkholes on the Bud Scranton farm in November, 2006.

General Notes:
1. Kornman Drainage District, situated just northwest of Kornman, Colorado maintains a series of open drains and tile lines which outlet into the Amity Canal after going through the town of Kornman. The district collects assessments for its operations through the Prowers County Assessor.
2. In order to locate the open and tile drains in the district, we have used several methods. The most important has been field observation with the assistance of landowners and those who maintain the tile lines and have experience with their locations. We have used information from several sources indicating where tile lines might be such as sinkholes, manholes, and aerial photo interpretation. Black and white aerial photos from the NRCS, color photos for the year 2000 from Prowers County, and recent 2005 aerial photos were used to assist in the location of tile lines.
We have located manholes, spots where repairs have been made, and/or sinkholes have occurred, and have had to "connect-the-dots" to map out the full tile lines. We are not certain, however, that all tile lines have been depicted exactly on the map as they were installed. Tile lines K2, K3, and K4, on the Bud Scranton farm have been located based on Mr. Scranton's knowledge, and the location of recent sinkholes. In particular, the length of these lines is a rough estimate. In short, we are not sure we have the tile lines drawn right, but this is the best approximation we have to this date. Hopefully, we can add to this knowledge base as more experience is gained with the exact location of the lines.

2. Note the spreadsheet included with these notes, which includes the recorded waypoint number (ident), type or category of reading, latitude, longitude, and date and time of reading.

General Notes from the fieldwork.
Mr. Scranton indicates that "We are finding old tile lines above new ones. In one location, we found an older clay tile about 4 feet deep, and a newer clay tile was about 10 feet. When we find the older clay tile at that depth, we just go ahead and dig deeper. The tile in this area has to be laid about ten feet deep to be effective. There is a clay barrier in this soil down about 10 feet. The tile must be put on top of that to work."
There are several original manholes– three on the Bud Scranton farm – redwood cedar manholes, which have been buried in recent time. Fragments of these manholes can be seen in the areas where they were replaced.

Mr. Scranton continues: "It appears that irrigation water goes down the cracks in the soil to the tile line, and then creates a seep or drain as it flushes soil down the developing seephole." A dead "mole rat" was also observed, which was a tan color, with a nose and head rounded like a mole with a tail about 2 inches long. Several individuals, including Mr. Scranton, have indicated these animals were responsible, at least in part, for digging holes down to the tile lines, thus, in effect, initiating sinkholes.
Fragments and sections of cement tile have been found,, which is speculated to be the first tile placed. It is thought that this was superceded by fired clay belled and non-belled tile from the "S. F. B. Company" in Pueblo.
We have found that the types of tiles may be mixed, that is, belled type and non-belled type in any given area. The tile used on the Bud Scranton farm was a fired clay 2 feet long and 8-inch inside diameter. At the red boxes, non-belled tile with an asphalt-like strip over the top 1/3 of the tile were installed. There may be belled tile in between the boxes.

Waypoints taken where open drain crosses underneath county roads: March 10, 2005:
Waypoint 265:
Middle of County Road 7 where open drain crosses under the road. It is the centerline of the open drain as well. This is on the east side of Section 12, T22S, R47W.

Waypoint 266:
Taken in the middle of Hwy 196 over the centerline of the main open drain of the Kornman Drainage District where it crosses under the highway. This is on the east side of the district. It is on the east side of Section 7, T22S, R46W.

Waypoints taken on Bud Scranton Farm: May 14, 2005: Clear day.
Waypoint 385:
This point is taken standing over the tile outlet in the northwest corner of the intersection of Hwy 196 and CR 7 (Prowers County) of the main east-west line that parallels Hwy 196. It is a 6-inch clay tile. It collects drainage from 3 north-south lines that are 528 feet apart, which are further west from this point. From this outlet, water exits and runs down the east bar ditch of CR 7 for reuse. There are no "rights" to speak of.

Waypoint 386:
This is a test point taken in the middle of the intersection of CR 7 and Hwy 196. Putting the point on the NRCS 1983 composite Mr Sid photo, shows it about 8 ft east-southeast of what appears to be the crossing of the centerlines of both roads.

Waypoint 387:
Taken while standing on top of the east-west main line along Hwy 196.

Waypoint 388:
Taken while standing on top of the east-west main line at a point where the 1st north-south line joins the main line from the north. See vegetative differences that may indicate where the tile line is located. The amount of mustard weed is greater along the line, and the alfalfa thinner because there is less seep from the north-south surface field ditch just to the west of this point which would feed the alfalfa.

Waypoint 389:
Taken at a repair location. A piece of broken tile is observed at this location. At this point, there was an older clay tile about 4 ft. deep, and the newer clay tile about 10 feet deep. This was repaired in July 2004. This is over one of the north-south lines, K3, which is 528 ft. from K2 and K4.

Waypoint 390:
This is the location of a 4 ft. square redwood box manhole. It was dug up and covered over in 2002. This line is a north-south line that heads north to the west end of a farm home.

Waypoint 391:
At the point of the "T" in the main east-west line with the north-south line (K3) coming into it from the north. This is the "T" of the line where the Waypoint 390 is taken. The red tile is the deep one, (the newer one) and the older concrete tile is the shallower one. The red tile is 8-inch tile.

Waypoint 392:
On top of a repair spot in a north-south line (K2) which should line up and go to Waypoint 388. Note: later we line it up with Waypoint 441, which we think better represents how the tile actually occurs in the field.

Waypoint 393:
At the junction or elbow of drains as they approach the west edge of the district. There is a short open drain coming from the north, which enters the main open ditch at this point. This waypoint is outside the actual district boundary.

Waypoint 394:
Taken on the south bank of the main open ditch at the point where it bends to the west-northwest. This waypoint is outside the actual district boundary.

Waypoint 395:
Upper end of the main open ditch of the Kornman Drainage District. This waypoint is outside the actual district boundary. We see a dead mole rat in a concrete structure which Bud says is a "mole rat". Olaf Sharp says that, in his experience, they dig down to the tile line and cause the sinks to begin forming.

Waypoint 396:
At this waypoint, there is both a surface drain here, coming from the north into the east-west open drain and a newer tile line to the east of the surface drain. The newer black plastic line was knifed in about 8 years ago, around 1997. We have drawn in the line in an approximate location, not knowing for sure where it is. There is some uncertainty as to whether this line will work because of its shallow placement.

Waypoint 397:
Taken at the outlet of an 8-inch tile line running north-south, where it dumps into the main open drain of the Kornman Drainage District. It functions well, and was placed deep. This

line runs north along the field boundary, across Hwy 196, another nearly ¼ mile to the upper edge of the large bowl in which it is placed.

Notes taken on 5/23/05: Conversation and subsequent waypoint location work:
The north-south lines are 528 feet apart. There are 4 of them.
We are not sure if they are all equally the same distance apart, though.
We have found a new sink hole. It is on a north-south line.

Waypoint 438:
This is taken on top of a repair spot in the north-south line (K2). This is a duplication of Waypoint 392 from above, that is, taken at the same location.

Waypoint 439:
This is a new sinkhole.

Waypoint 440:
We think this is the location of the "T" where a north-south line ties into the east-west main line. This line runs straight north to the 4th electric pole to the east of Bud's house.

Waypoint 441:
We think this is a "T" where a north-south line enters the east-west main. This runs from this waypoint northward to the 3rd electric pole east of Bud Scranton's farm. The Waypoints 439 and 438 are taken on top of this north-south line. At this "T", we see flagstones of sandstone, limestone and limestone chips, and shale chips in the bar ditch on the north side of the road. We think this is detritus from the digging of an old manhole which was put in where the "T" of these lines were placed. They didn't have a manufactured "T", so they used a redwood box to make the junction of the tile lines. Bud Scranton has found these fragments, which come from about 10 ft deep in this area near the old manhole locations.

We lose battery power and have to shift gps unit to non-differential locational mode.
We are over the main east-west line on top of the north-south line that heads northward to the west end of Bud's house, where it "T"'s into the main line. We find redwood pieces, one a couple of inches around, and 8 inches long or so, and another an obvious fragment of the former piece. These look like they are remnants of an old 2x4 or 2x6 which has deteriorated. This make us think there was as redwood box here at one time. On this farm, there was a redwood box at each "T" in the system. We go on west to what is later identified as Waypoint 444 and find shale shards in the north ditch. These shards are typical of what is found about 10 ft deep just above the rock layer.

Waypoint 442: (Using Garmin GPS76 unit without differential corrections).
This waypoint is in line with the first north-south line, which runs toward the 4th electric pole eastward from Bud Scranton's house.

Waypoint 443:
We find a piece of redwood here. We think there was a manhole here. This north-south line runs directly northward to the west edge of a farmhouse. We are on the north edge of Hwy 196, 10 feet north from the white line on the side of the road in the bar ditch.

Waypoint 444:
We find shale shards here in the open ditch on the north side of the road. We think there was a redwood cedar manhole here at this location. We think the east-west line ends here, and the last of the 4 north-south lines connects from the north at this point.

Waypoints taken on November 13, 2006.
Waypoint 836:
Clay tile shards are visible on the surface. See also Red Cedar from the buried manhole. Sinkhole is 1 ½ feet deep, 10 feet north-south, 20 feet east-west.

Waypoint 837:
East end of same sinkhole. We found wood fragments coming from buried manhole.

Waypoint 838:
West end of sinkhole trench.

Waypoint 839:
Sinkhole 2 feet deep and 4 feet x 2 feet rectangular shape.

Waypoint 840:
Sinkhole 1 feet deep and 2 feet in diameter.

Waypoint 841:
South end of sinkhole trench.

Waypoint 842:
Middle of north-south sinkhole trench 10 feet wide and 1 – 2 feet deep.

Waypoint 843:
North end of north-south sinkhole trench. Shallow, about 1 foot deep.

Waypoint 844:
South end of a visible vegetative difference in alfalfa growth. The alfalfa is more dense, and taller than surrounding alfalfa, and clearly visible as a “row” in the field. We are certain that there is a tile line beneath this point.

Waypoint 845:
North end of “row” of greener alfalfa referred to above in Waypoint 844.

Waypoint 846:
Sinkhole 3 feet in diameter and 1 ½ feet deep.

Waypoint 847:
Sinkhole 3 feet in diameter and 1 ½ feet deep.

Waypoint 848:
Sinkhole 2 feet in diameter and 1 ½ feet deep.

Waypoint 849:
Sinkhole 1 foot deep and 4 feet in diameter.

Other Notes:
Mr. Scranton measured the distance from the west property line to the first north-south line on the east side of this quarter section. The distance was 26.5 chains or 1765 feet. (multiply 26.5 times 66.6 feet). The second line is 19.8 chains from the west property boundary. (1319 ft.)

Tile line measurements (ArcView – computer software measurement)

K1	1743 ft.
K2	2915 ft.
K3	3089 ft.
K4	3327 ft.
K5	3898 ft.
K6	2776 ft.

Total tile length (approx.) 17,747 feet.
This is a rough estimate, especially the lengths of K2, K3, and K4.
The measured length of the open drain strictly within the district boundaries is 10,072 feet.

Area of Kornman Drainage District:
74,342,618.66 square feet
1,706.67167 acres

Notes on the Drainage Infrastructure:
Total Acreage in District: 1,706.7
- Not affected by wetness: 1,447 acres
- Areas of Moderate effect: 260 acres
- Areas of Severe effect: 0 acres

Possibilities for maintenance and repairs:
- Clean the whole open ditch.
- 3 new lines are needed
- Clean all the tile lines.

Areas affected by wetness: Moderate affect = 259.53 acres
Existing Tile Lines needing cleaning: 17,747 feet.
Existing Open Drain needing cleaning: 10,072 feet.
Potential new tile lines: 11,679 feet
- Sizing possibilities:
  - 1/3 8” = 3,893 feet
  - 2/3 6” = 7,786 feet

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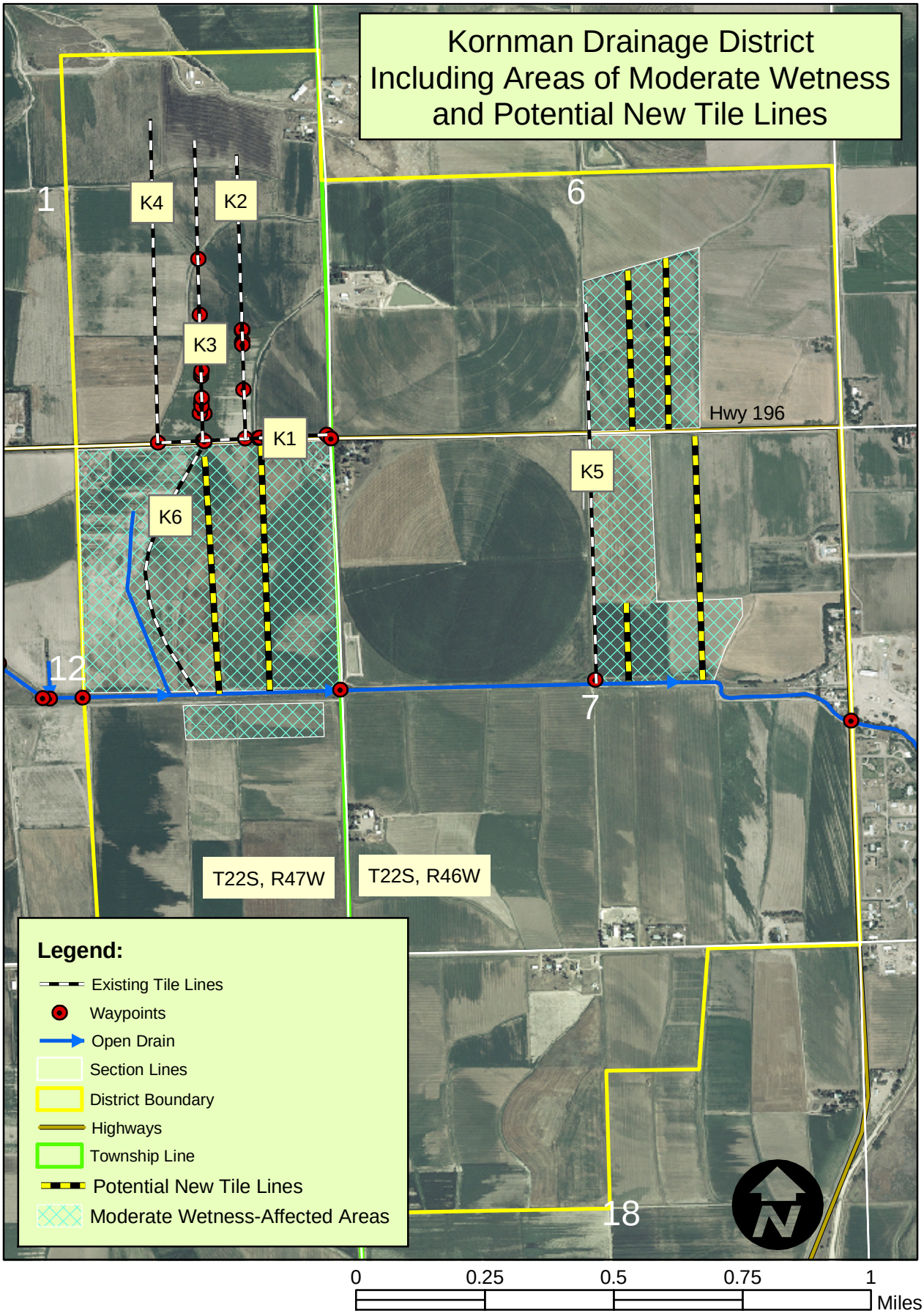
Following is a spreadsheet of the waypoint logs showing the waypoint number (ident), the occasion of taking the waypoint, or what it was (Type), Latitude and Longitude readings, and the date and time (Comment) when the waypoint was taken. On the page following these logs is a key to the items under "Type".

Ident	Type	Lat	Long	Comment
265	DitchRdCro	38.15075138	-102.6320617	3/10/2005 14:11
266	DitchRdCro	38.14950541	-102.613859	3/10/2005 14:23
385	TileOutlet	38.15794003	-102.6323164	5/14/2005 8:23
386	FieldObs	38.15782537	-102.6321586	5/14/2005 8:26
387	TileLoc	38.1578998	-102.63476	5/14/2005 8:36
388	TileLoc	38.15790751	-102.6347096	5/14/2005 8:40
389	Repairscar	38.15889817	-102.6367616	5/14/2005 8:58
390	Repairscar	38.1590037	-102.6367402	5/14/2005 9:01
391	TileLoc	38.15787097	-102.6367324	5/14/2005 9:10
392	Repairscar	38.16093262	-102.6352354	5/14/2005 9:47
393	OpenDitch	38.15070628	-102.6424358	5/14/2005 10:11
394	OpenDitch	38.15072112	-102.6426781	5/14/2005 10:12
395	OpenDitch	38.15173323	-102.6442253	5/14/2005 10:15
396	OpenDitch	38.15070318	-102.6412562	5/14/2005 10:29
397	TileOutlet	38.15083763	-102.6229528	5/14/2005 11:00
438	Repairscar	38.16094134	-102.6352207	5/23/2005 15:52
439	Sinkhole	38.15926286	-102.6352432	5/23/2005 15:58
440	TileLoc	38.15791111	-102.6344043	5/23/2005 16:26
441	TileLoc	38.15789653	-102.6352212	5/23/2005 16:31
442	TileLoc	38.15788714	-102.634405	5/23/2005 17:32
443	Repairscar	38.15784012	-102.6366863	5/23/2005 17:38
444	FieldObs	38.1578309	-102.6383412	5/23/2005 17:43
836	Sinkhole	38.15864093	-102.6367453	11/13/2006 12:02
837	Sinkhole	38.15862416	-102.6366553	11/13/2006 12:05
838	Sinkhole	38.15864277	-102.6368193	11/13/2006 12:06
839	Sinkhole	38.15882985	-102.6367479	11/13/2006 12:07
840	Sinkhole	38.15907285	-102.6367333	11/13/2006 12:08
841	Sinkhole	38.15968565	-102.6367339	11/13/2006 12:10
842	Sinkhole	38.15975639	-102.6367345	11/13/2006 12:11
843	Sinkhole	38.15983795	-102.6367223	11/13/2006 12:11
844	FieldObs	38.16141299	-102.6367376	11/13/2006 12:17
845	FieldObs	38.16298242	-102.6367272	11/13/2006 12:22
846	Sinkhole	38.1609633	-102.6352453	11/13/2006 12:27
847	Sinkhole	38.16063046	-102.6352336	11/13/2006 12:28
848	Sinkhole	38.16058997	-102.6352577	11/13/2006 12:28
849	Sinkhole	38.16053767	-102.6352338	11/13/2006 12:29

ArcView Field Title	Possible Entry	Explanation Key
Ident		GPS Waypoint Identification Number
Lat		Latitude of reading
Lon		Longitude of reading
Comment		Date and time of reading
Type		
	Manhole	Manhole
	ManhBur	Buried Manhole
	ObsPoint	observation point - generally vert. Pipe extending to tile line from surface
	Inlet	Inlet, or beginning of line
	TileOutlet	End of tile line dumping into seep ditch, or open drain
	BurOutl	Outlet of a tile drain that is buried beneath the surface
	OpenDitch	Open drainage ditch. Seep Ditch
	TileLoc	Location of Tile Line
	TileJunc	Loc. of Tile Junction where more than two lines meet
	TileElbow	Loc. of Elbow in tile line where line bends
	TileRdCross	Crossing of Tile Line under Road
	DitchRdCro	Crossing of Open Ditch under Road
	CanalTileCross	Crossing of Tile Line under Canal
	Repairscar	Location of point where tile has been repaired: generally visible soil disturbance
	Sinkhole	Loc. of place where soil has washed down into tile line, leaving an open hole
	Openhole	Open hole in ground, varying depths and sizes. Relates to tile location.
	FieldObs	Location of relevant condition observed in the field relating to the possible location of tile lines.
	SurfDrainStr	Structure for drainage of surface water. May be culvert, or similar structure.


Kornman Drainage District
Including Areas of Moderate Wetness
and Potential New Tile Lines
1
6
12
7
18
K1
K2
K3
K4
K5
K6
Hwy 196
T22S, R47W
T22S, R46W
Legend:
Existing Tile Lines
Waypoints
Open Drain
Section Lines
District Boundary
Highways
Township Line
Potential New Tile Lines
Moderate Wetness-Affected Areas
0
0.25
0.5
0.75
1
Miles

SUMMARY OF DRAINAGE DISTRICTS

STATE Colorado

WATER DISTRICT OR AREA No. 67

SUMMARY OF DATA ON KORNMAN DRAINAGE DISTRICT DATE September 1942

Irrigated from Ft. Lyon Canal Co. System

GENERAL

LOCATION: STATE Colorado COUNTY Prowers NEAR Lamar

ACRES: GROSS 1800 ASSESSED 1754.36 SUSTAINING 1600

UNIT OF ASSESSMENT (1) Dollar of assessed benefits

TOTAL UNITS: ORIGINAL 91,905 SUSTAINING 77,700

UNITS OF ASSESSMENT PER ACRE: AVERAGE $ 52 MAXIMUM $ 98 MINIMUM $ 10

LIABILITY FOR DISTRICT OBLIGATIONS Each tract liable for 100% of ass'ts.levied against it.

LOCATION OF ASSESSMENT RECORDS A. C. Gordon, Attorney, Lamar

LAND: BAD ALKALI 2 %; SLIGHT ALKALI 25 %; HIGH WATER TABLE 3 %; TREND stable

ELEVATION 3800 FT. AVERAGE GROWING SEASON 164 DAYS April 28 TO October 10

PRECIPITATION IN INCHES: ANNUAL AVERAGE 16.05 ;CHARACTERISTICS OF RAINFALL 76% from 4/1 to 10/1. Erratic - maximum 24.5";minimum 7.4";maximum daily 4.3". Intense storms in summe months.

ECONOMIC & FINANCIAL CONDITIONS

GENERAL TAXES ON LAND AND IMPROVEMENTS: AVERAGE $ 1.25 PER ACRE

CAPITAL DEBT AS OF September 1 1943 ; BONDS $ 4500 @ 6½% PAYABLE 19 38-40

WARRANTS $ @ % PAYABLE 19 ; OTHER DEBTS $ @ % PAYABLE 19

NET CAPITAL DEBT: $ 3914 , ADJUSTED TO AN EQUIVALENT 6% BASIS $ 3914

OR $ 0.05 PER SUSTAINING (1) Dollar of assessed benefits.

B. & I. ASSESSMENTS FOR PERIOD 1932-41 AVERAGED $ 0.0358 PER (1) $1 of ass'd benefits

O. & M. ASSESSMENTS FOR PERIOD 1932-41 AVERAGED $ 0.0020 PER (1) $1 " " "

ESTIMATED FUTURE ANNUAL ASSESSMENTS PER SUSTAINING (1) dollar of assessed benefits

B. & I. $ none O. & M. $ (1) 0.004

HISTORY AND TREND OF DEBT AND ASSESSMENTS District issued $28,500 of 6½% bonds in 1922, payable serially 1933-40. Part of owners paid cash but bonds became in default and majority bought up distressed bonds and paid off drainage debt on individual lands. No levies for B&I or O&M since 1939 and no future B&I levies expected. Future O&M expected to be higher than in past 10 years.

THESE LANDS ARE all SUBJECT TO OTHER ASSESSMENTS BY Ft. Lyon Canal Co. and part by lateral ditch companies.

PHYSICAL CONDITIONS

EFFECTIVENESS OF SYSTEM AND ADEQUACY OF PAST MAINTENANCE System has been generally effective and practically the entire area is under cultivation. Main difficulties have been experienced in NE¼ Sec. 12 and SE¼ Sec. 1, T 22S, R 47W. Maintenance has been of a poorer quality in the past than would normally be expected of a good area of this type. Two miles of open outlet drain and 3 miles of tile.

AREA HAS not BEEN ZONED. (SEE ZONE DESCRIPTIONS IF IT HAS BEEN ZONED)

EXPECTED FUTURE ADEQUACY OF MAINTENANCE Maintenance is expected to be sufficient to maintain district in its present state of development. Probably will not be first class but of a better quality than in the past.

CHARACTER OF FLOODS (2) No hazard

RECOMMENDATIONS: APPRAISAL FACTORS IN (3) Percent of assessed benefits.

TOTAL DEDUCTION $ none UNTIL 19 19

ANNUAL B. & I. $ none ANNUAL O. & M. 0.4%

(1) Dollar of assessed benefits, or dollar of assessed valuation, or acre- district's method of assessment

(2) Supplement by attaching gage record tables where available

(3) % of assessed benefits, or % of assessed valuation, or dollars per acre

(SEE REVERSE SIDE FOR ADDITIONAL INFORMATION)

(over)

D-101 DRAINAGE DISTRICTS

STATE Colorado
WATER DISTRICT OR AREA No. 67
DATE OF INSPECTION September 1942

NAME OF DISTRICT KORNMAN DRAINAGE DISTRICT
Irrigated by Ft. Lyon Canal Co. system
LAND LOCATION 4 MILES N OF Lamar
IN Prowers County COUNTY. TOWNSHIP 22S RANGE 46 & 47 W

ORGANIZATION

DATE OF ORGANIZATION July 5, 1921 UNDER LAW OF 1911 and 1919
AMENDMENTS TO ORIGINAL ORGANIZATION —
ACRES: GROSS 1800 ,ASSESSED 1754.36 , SUSTAINING 1600
UNIT OF ASSESSMENT (1) Dollar of assessed benefits
TOTAL UNITS: ORIGINAL 91,905 SUSTAINING 77,700
UNITS OF ASSESSMENT PER ACRE: AVERAGE $ 52 , MAXIMUM $ 98 , MINIMUM $ 10
LIABILITY FOR DISTRICT OBLIGATIONS Each tract liable for 100% of ass'ts. levied against i
NAME AND ADDRESS OF SECRETARY J. P. Koontz, Lanar, Colorado
LOCATION OF ASSESSMENT RECORDS A. C. Gordon, Attorney, Lamar, Colorado

TYPE OF LAND

GENERAL Rectangular tract of bench land. U.S.B.R. Classification:
Cl. 1 - 70%; Cl. 2 - 27%; Cl. 5 & 6 - 3%.

TOPOGRAPHY
Gently sloping to relatively flat.

SOILS: PREDOMINANT TYPES Prowers clay loam - 60%; Ft. Lyon loam - 30%;
Prowers loam - 10%.

PER CENT OF AREA: BAD ALKALI 2 %, SLIGHT ALKALI 25 %, HIGH WATER TABLE 3 %
TREND stable

CLIMATE

ELEVATION 3800 FT., AVERAGE GROWING SEASON 164 DAYS April 28 TO October 10
RAINFALL AT Lamar STATION 4 MILES FROM DISTRICT - 16.05 inches
LENGTH OF RECORD 53 YEARS 1889 TO 1941 , ACCURACY good
CHARACTERISTICS OF RAINFALL 76% from 4/1 to 10/1. Erratic - maximum 24.5"; minimum 7.4";
maximum daily 4.3". Intense storms of short duration in summer months.

CROPS

CROPS	% OF AREA	CROPS	% OF AREA	CROPS	% OF AREA
ALFALFA	50	POTATOES			
CLOVER		SUGAR BEETS	5		
OTHER HAY		melons & truck	2		
PASTURE	3				
CEREALS	20				
CORN	10				
SORGHUMS	10				

SOURCE OF INFORMATION U.S.B.R. survey & W.C. reports ACCURACY fair
YIELDS AND TRENDS Moderately good yields normally obtained over most of this area.
Trend toward more corn and sorghums and less small grain.
DISPOSITION OF CROPS About 50% of crops sold for cash, including half to two-thirds
of alfalfa crop. Remainder to range cattle and farm livestock, including turkeys

ECONOMIC CONDITIONS

NO. OF FARMS 15 . TENANCY APPROX. 40 %. CONDITION OF FARM IMPROVEMENTS fair to good

GENERAL CHARACTER OF FARMS AND FARMERS Good farms and farmers. American nationality.

GENERAL TAXES ON LAND AND IMPROVEMENTS: AVERAGE $ 1.25 PER ACRE
TRANSPORTATION FACILITIES Branch line of A.T. & S.F. Ry. at Kornman, in district.3
miles from U.S. Hy. No. 50. Good, gravel surfaced roads in area.
MARKETING FACILITIES Alfalfa mill, elevator, beet dump and packing sheds at Kornman.
Turkey co-op. and cattle feed lots at Lamar. Good outlet for cash crops and
for surplus feed.

(1) Dollar of assessed benefits, or dollar of assessed valuation, or acre - district's method of assessment

KORNMAN DRAINAGE DISTRICT

OPERATION AND MAINTENANCE ACCOUNT AS OF September 1 19 42

ASSETS		LIABILITIES	
CASH ON HAND	$ 406.64	WARRANTS OUTSTANDING	$
ASSESSMENTS RECEIVABLE		OTHER	
MISCELLANEOUS RECEIVABLE			
TOTAL	$ 406.64	TOTAL	$ none

CAPITAL DEBT SCHEDULE

INDEBTEDNESS	AMOUNT	INT. RATE	AMOUNT PER UNIT	REPAYMENT PERIOD
*BONDS	$ 4500	6½ %	$ 0.049 PER $1 ass'd.ben.	1938-40
BONDS		%	PER	
BONDS		%	PER	
WARRANTS		%	PER	
OTHER			PER	
TOTAL	$	%	PER	

NOTE: IF ANNUAL PAYMENTS ARE VARIABLE ATTACH DETAILED REPAYMENT SCHEDULES

Original issue $28,500 - payable 1933-40

CAPITAL DEBT ACCOUNT AS OF September 1 19 42

ASSETS		LIABILITIES	
CASH ON HAND	$ 728.19	WARRANTS OUTSTANDING	$
CURRENT ASSESSMENTS RECEIVABLE		BOND PRINCIPAL UNMATURED	
DELINQUENT ASSESSMENTS RECEIVABLE		BOND PRINCIPAL DELINQUENT	4500
MISCELLANEOUS RECEIVABLE		INTEREST DELINQUENT	142.40
TOTAL	$ 728.19	TOTAL	$ 4642.40

CAPITAL DEBT IF ALL ASSESSMENTS ARE COLLECTED..... $

ESTIMATED CURRENT AND DELINQUENT ASSESSMENTS COLLECTIBLE.....

NET CAPITAL DEBT.....

NET DEBT ADJUSTED TO AN EQUIVALENT 6% BASIS.....

NET ADJUSTED DEBT PER SUSTAINING (1).....

PAST ANNUAL ASSESSMENTS IN DOLLARS PER dollar of assessed benefits

ITEM:	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	AVE.
A											
B											.0358
SUB-TOTAL											
C											.0020
*TOTAL:	.0426	.0358	.0464	.0484	.0484	.0565	.0565	.0437			.0378

A - WARRANTS. B - BONDS & INTEREST. C - O. & M.

* B&I and O&M - separate levy for O&M not clear from record - about .002 ave. O&M

ESTIMATED FUTURE ANNUAL ASSESSMENTS PER SUSTAINING (1) dollar of assessed benefits

ANNUAL B. & I. $ none ANNUAL O. & M. $ .004

HISTORY AND TREND OF DEBT AND ASSESSMENTS District issued $28,500 of 6½% bonds in 1922, payable serially 1933-1940. Part of owners paid but bonds became in default and most owners bought up distressed bonds and paid off drainage debt. No levies for B&I or O&M since 1939. No further levies will be made for B&I but O&M assessments may be anticipated in future at somewhat higher figure than last 10 years.

THESE LANDS ARE all SUBJECT TO OTHER ASSESSMENTS BY Ft. Lyon Canal Co. and part by lateral companies.

(1) Dollar of assessed benefits, or dollar of assessed valuation, or acre - district's method of assessment

KORNMAN DRAINAGE DISTRICT

CONSTRUCTION

COST OF CONSTRUCTION: ORIGINAL $ 28,500 PRESENT UNPAID $ 4,500

OUTLET OF SYSTEM: STREAM May Valley draw SEC. 8 TWP. 22S R. 46W

EFFECT OF BACKWATER none

LENGTH OF MAIN DRAIN 2 MILES; LATERALS 3 MILES. TOTAL LENGTH 5 MILES

ADEQUACY OF SYSTEM Main drain - open ditch. Laterals 10" and 12" tile. System has proved adequate except for a limited area in the NE¼ Sec. 12. and in the SE¼ Sec. 1, T. 22S, R 47W. Tile line clogged and broken in NE¼ of Sec. 12, which apparently causes the difficulty. Other tile lines are functioning but outlet canal needs deepening at outlet of tile lines in order to flow free.

PROBABLE NEW CONSTRUCTION None anticipated.

GENERAL EFFECTIVENESS OF SYSTEM AND ADEQUACY OF PAST MAINTENANCE

System generally effective except as noted above. It has had very little spent on it in the past for maintenance. The main drain is filled to within about 3 feet of the surface for the lower one-half mile but no detrimental results can be noted. Maintenance is below the standard that might be expected in a first class area of this type, but this may be because of a succession of dry years, when drainage was not needed.

FUTURE MAINTENANCE: ANNUAL COST (1) $ 0.004 per dollar of assessed benefits.

EXPECTED FUTURE ADEQUACY

It is expected that the system will prove adequate in the future to the same extent it has in the past, and that future maintenance will be somewhat better. It is too good an area to allow any retrogression because of poor maintenance, even though the system has been indifferently kept up in recent years. A new board has been elected and it is anticipated that a regular maintenance program will be followed.

Estimated average annual costs -$300.00.

(1) Dollar of assessed benefits, or dollar of assessed valuation, or acre-district's method of assessment