

STUDY OF THE ALBION - SCIPIO FIELD
OF MICHIGAN

Thesis for the Degree of M. S.
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WILLIAM CLIFTON BISHOP
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STUDY OF THE ALBION - SCIPIO FIELD
OF MICHIGAN

BY

William Clifton Bishop

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
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ABSTRACT

STUDY OF THE ALBION - SCIPIO FIELD
OF MICHIGAN

by William Clifton Bishop

The Albion - Scipio Field of south-central Michigan produces from the Middle Ordovician Trenton - Black River formations. This synclinal field trends in a northwest-southeast direction conforming to the structural grain of the Michigan Basin.

Information from radioactivity logs provided data in determining thickness and the structure of formations encountered. Close spacing of wells permitted the correlation of some reservoir characteristics.

Discontinuous fracturing of the Trenton - Black River limestones, along lines of pre-existing weakness present in the basement complex, has served as an avenue for solution activity during Devonian time. This solution activity has caused the development of a trough in the Trenton limestone. Oil and gas entrapment are controlled by the degree of fracturing, solution activity, dolomitization, and cross faulting.

Similar features may be seen in other Trenton - Black River Fields which may assist in petroleum exploration.

Acknowledgments

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INTRODUCTION

Location

The largest Ordovician petroleum field in Michigan is located in the south central portion of the state. The Albion - Scipio Field, often referred to as simply "the Trend," extends approximately 35 miles in a northwest - southeast direction through Hillsdale, Jackson and Calhoun counties. (Figure 1). "The Trend" includes several linear oil fields with a maximum width of less than one mile. Oil and gas are produced from a dolomitized fracture or fault zone in the Trenton and Black River formations of Middle Ordovician age. The depth of production varies from approximately 3,200 feet in the southeast portion of the field to 4,500 feet in the northwest portion of the field.

History of the Albion - Scipio Field

Prior to the development of the present "Trend" discovery well, only a few widely spaced Trenton tests had been drilled. Most of these wells were drilled as a result of gravity surveys; others as hunches or on the sparse subsurface data available (Ives, 1960). The Albion Gas Field was discovered in 1941, the gas having been produced from a shallow zone in the Devonian Traverse limestone. The field was developed to four wells and was located over the present deeper Albion - Scipio Field production. An earlier Trenton test (in the Albion Gas Field) had been cored, and showed some fracturing and oil saturation in the dolomitized Trenton formation, but was plugged and abandoned without further testing as a dry hole in the Trenton formation. (Ives and Ellis, 1959). The cumulative production of the Albion Gas Field was 6,114 MCF of gas before it

was abandoned in 1948.

The discovery well of the Albion - Scipio Field was drilled in Scipio Township. The location of the well was not based on geology, and was between two gravity highs. According to Ives' (1960) description of the discovery well:

"The test, Perry No. 1 Houseknecht, NW $\frac{1}{4}$, SE $\frac{1}{4}$, NE $\frac{1}{4}$, Section 10, T5S, R3W, was spudded in May of 1955. The top of the Trenton was penetrated at 3,563 feet. The first gas shows were recorded in September of 1956 at a depth of 3,650 feet. It was not until January of the following year that oil was encountered at a depth of 3,776 feet. The well finally bottomed out at 3,900 feet in July and was completed for flowing 10 barrels of oil per hour."

After several off-set wells with similar sizable production had been completed, the field was named after the township of Scipio. With the discovery of the Scipio Field, there was further stimulation of wildcat drilling in south central Michigan. Twelve miles north of the Scipio Field, in December of 1958, the Albion Township discovery was completed which was only a mile and a half from the abandoned Albion Gas Field. The Albion discovery well, Rosenau No. 1, at a depth of 4,324 feet, had an initial production of 200 barrels of oil per day. A wildcat well was started in Pulaski Township between Scipio and Albion townships about the same time as the Albion Field discovery well was started. It was not completed until early January of 1959, with the first show of gas at the depth of 3,766 feet and the first oil at 3,815 feet. The Blair No. 1 well became the Pulaski Field discovery well with an initial production of 386 barrels of oil per day flowing. The Pulaski Field completed the excellent lineation of the three fields, Albion - Pulaski - Scipio, into a trend as shown in Figure 2. Further wildcat discoveries and "on Trend"

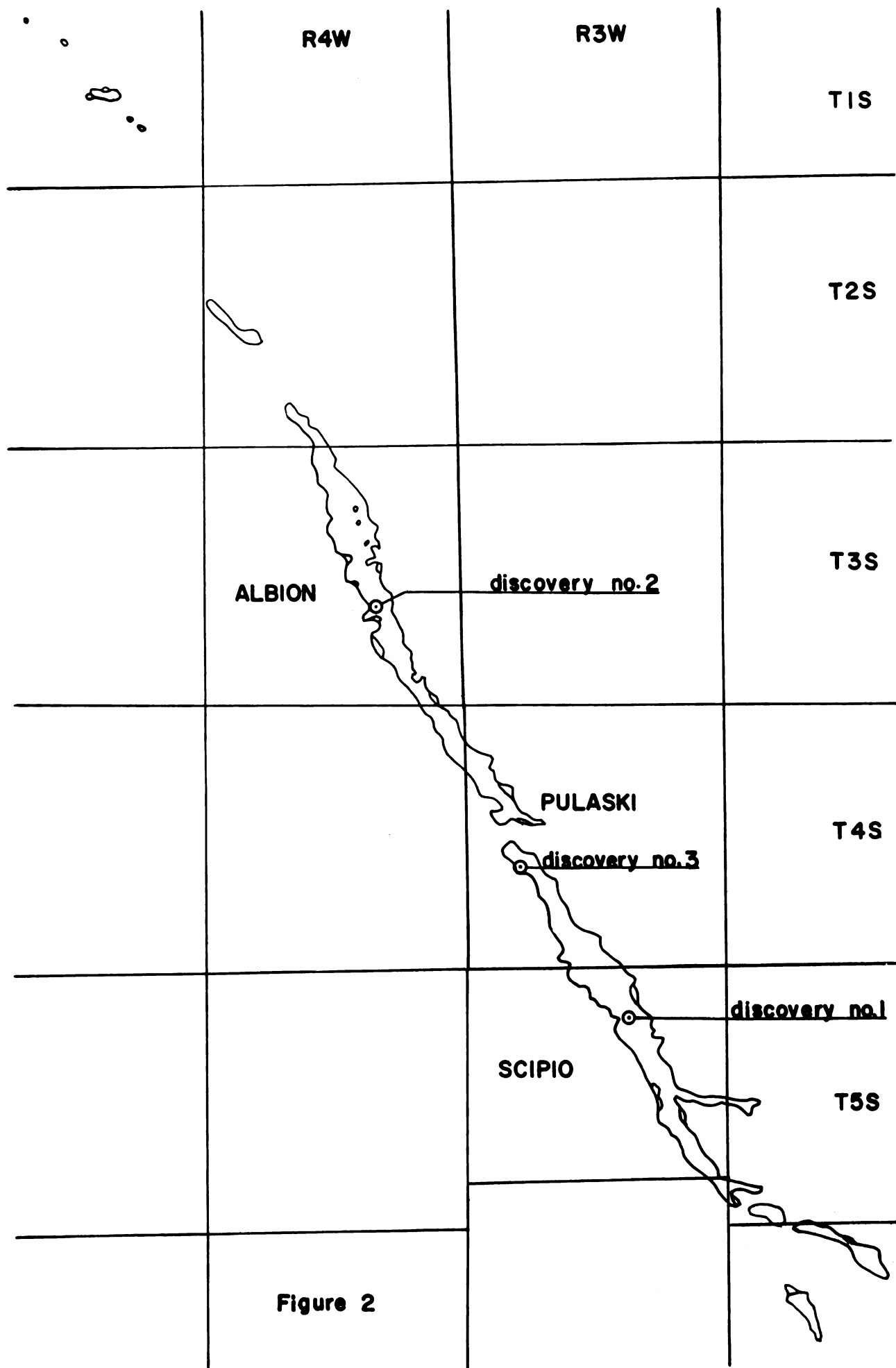


Figure 2

development merged the three fields and extended the "Trend" southeast to Adams Township, Hillsdale County in 1959 and northwest to Lee Township, Calhoun County in 1960.

Production History of the Field

In Michigan, prior to the discovery of the Albion - Scipio Field in 1956, there were five Trenton - Black River Fields, the oldest discovered in 1920. These fields produced approximately a half a million barrels of oil. Figure 3 illustrates annual Trenton - Black River oil production in Michigan. From the discovery of the Albion - Scipio Field to the end of 1963, the field has produced over 40 million barrels of oil. Figure 4 summarizes production of the field on an annual basis. Perhaps the most significant Trenton - Black River production is the Lima - Indiana Field located in Ohio and Indiana. A near abandoned field now, it has produced since 1884 and cumulative production has been estimated at over 500 million barrels of oil.

The wells within the Albion - Scipio Field are located along the dolomitized "fracture trend" and produce from the Trenton limestone and the Black River limestone. The average oil pay is about 60 feet thick, but the production and pay thickness are irregular depending on the presumed degree of fracturing and solution activity. Many extensive lost circulation zones and high gas pressure build-ups are encountered in the Trenton - Black River section and this has made well completions difficult and has added to the difficulty in direct examination of producing horizons. The field has a characteristic gas cap and oil-water interface.

The following is a short history of pressure declines and the barrels of oil produced per pound of decline between the initial survey and subsequent surveys (obtained from records of the Michigan Geological Survey).

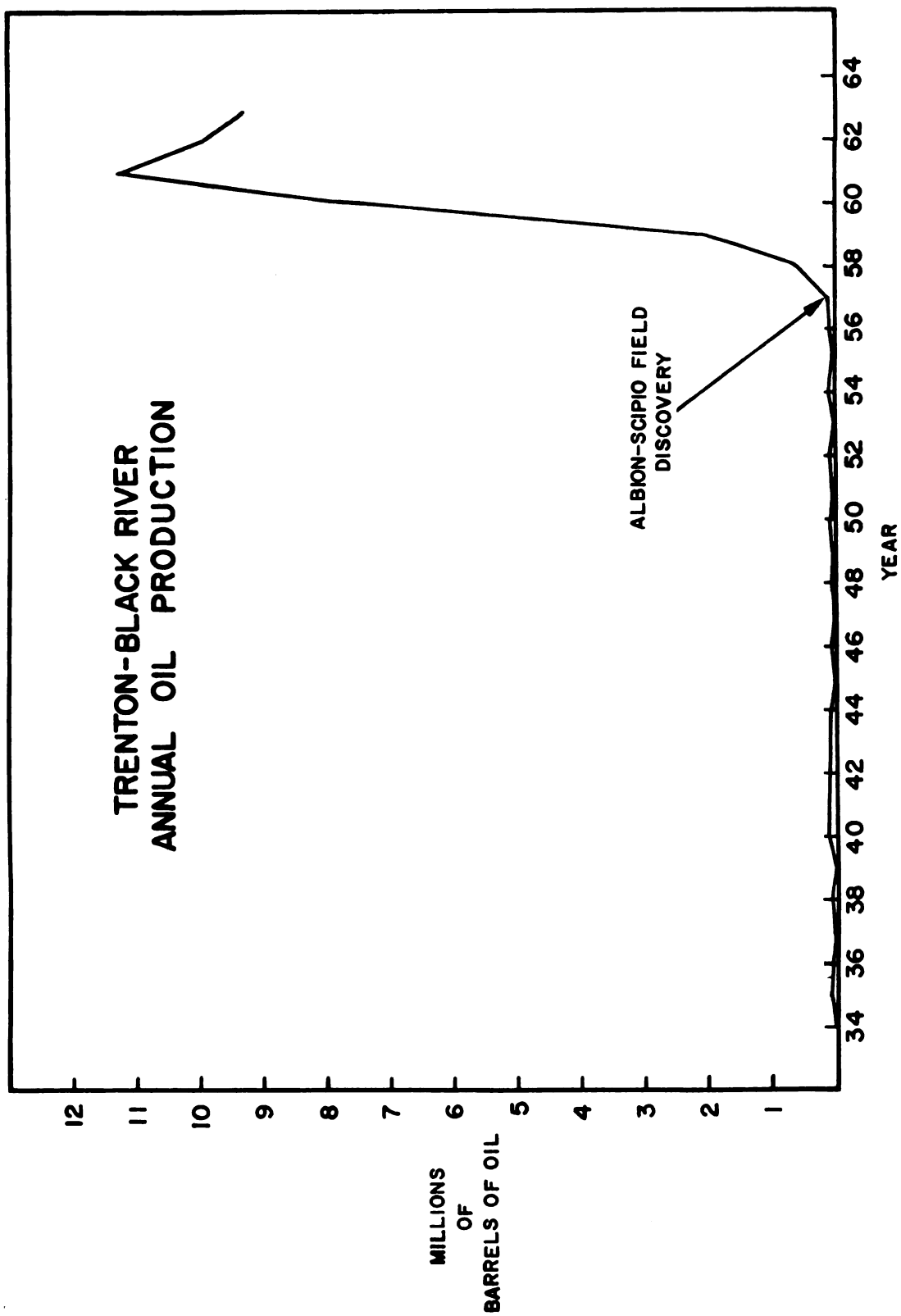


Figure 3

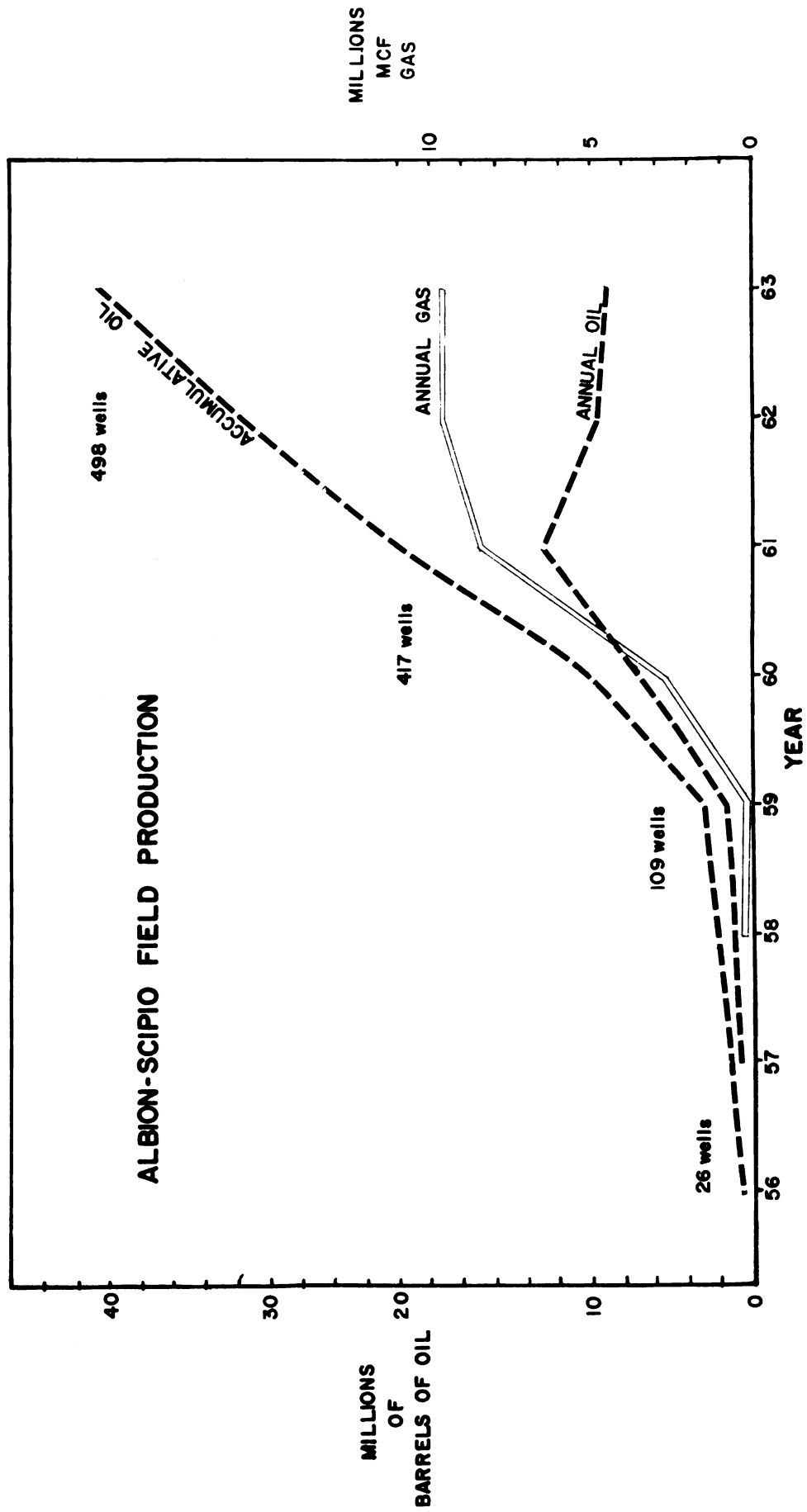


Figure 4

-2850- Datum

<u>Data from Survey to Survey</u>			<u>Cumulative from original survey</u>	
	<u>Pressure</u> <u>Decline</u> <u>p.s.i.</u>	<u>Oil Production</u> <u>Per. Lbs. Drop</u> <u>Barrels</u>	<u>Pressure</u> <u>Decline</u> <u>p.s.i.</u>	<u>Oil Production</u> <u>Per. Lbs. Drop</u> <u>Barrels</u>
5/62-10/62	-51	43,720	-413	40,900
10/62-5/63	-52	57,649	-465	42,773
5/63 -5/64	-79	70,636	-537	47,430

The field is presently prorated at 110 barrels of oil and/or 165 thousand cubic feet of gas per day per well.

Oil reserves have been estimated in excess of 5,000 barrels of oil per drilled acre Ives (1959) and as of January 1, 1964 approximately 9,800 acres had been proven productive. Presently, the Albion - Scipio Field is producing an estimated 60% of the oil and 40% of the gas for the entire state of Michigan.

Purpose of Investigation

The purpose of this investigation is to attempt to determine the geological causes of oil and gas accumulation in the Albion - Scipio Field. Albion - Scipio is an important oil producing field in the Michigan basin and exhibits many geological problems on which few studies have been presented for the entire field.

Method of Investigation

Radioactivity logs for 865 wells within the Albion - Scipio Field and adjacent area, were used solely for structural control and formation thickness data (listed in appendix). Gamma ray - neutron logs have been recorded for approximately 95% of the wells drilled in the field area.

The gamma ray type of mechanical log was used principally for lithologic definition and correlation for this investigation. The neutron log was used principally for porosity determination. The formations in the Michigan basin are generally an alternating sequence of carbonates, argillaceous carbonates, shales and evaporites, shown in Figure 8. The majority of the formations can be correlated by gamma ray - neutron log characteristics, however, some formation characteristics are not easily identified on either gamma ray or neutron logs. The formations in this investigation that appear in quotation marks are formations that are chosen on radiation characteristics, which may or may not conform to standard formation descriptions. These subsurface formation markers are generally accepted by Michigan geologists but some of these markers cannot be correlated with the regional geology and their use is limited. A gamma ray log cross-section, northwest - southeast, through the Albion - Scipio Field, is shown in Plate I. The eight "type" wells, with an approximate five mile spacing, are used for correlation only, and because of the relative position of the wells, up or down, the regional dip should not be inferred within the field. Exceptionally dense control for correlation purposes can be obtained due to the 20 acre spacing of wells within the field. A short distance from the field, wildcat drilling is very sparse and control becomes deficient in detail.

In areas of the field that are regarded as pertinent to this study, lithologic logs, pressure data and other well records have been examined.

Previous Work

Many oil companies having an active interest in the Albion - Scipio Field, have initiated detailed investigations and research but none of

this information, to the author's knowledge, has been published. Numerous small articles have been published about the trend field. The only significant investigation is that of Ells (1962), which is a detailed study of three designated areas of the field. Hinze and associates (1962) directed a shallow seismic refraction survey in the vicinity of the Albion - Scipio Field. Other areas of investigation include a one well core analysis by Kirschke (1962) and a multi-well study of the Ordovician rocks in Hillsdale County and adjacent areas by O'Connell (1958). There has been no study published that deals with the Albion - Scipio Field in its entirety with as much control available as in the present investigation.

TECTONIC FRAMEWORK

Description of Tectonic Features and Possible Effects on the Michigan Basin

The general characteristics of the Michigan Basin Figures 5 and 6, can be outlined as follows: (1) diameter of approximately 400 miles, (2) near oval shape with a northwest - southeast axis of elongation, (3) in cross section, an asymmetrical basin with a relatively steep north-east slope, (4) deepest portion of basin has 14,000 to 15,000 feet of Paleozoic sediments, (5) many structural features within the basin have a northwest - southeast trend.

There is little agreement on the exact cause and age of the formation of the Michigan Basin, but it is generally the opinion that the basin was formed in late Precambrian or Ordovician time, (Pirtle, 1932) (Newcombe 1934).

The Wisconsin Arch, which strikes N 20° W, is believed to be a Precambrian mountain range of the magnitude of the Alps, Alleghenies or Rockies which was base leveled before Paleozoic time (Pirtle, 1932) (Lockett, 1947). The Kankakee Arch, according to Pirtle (1932), is a relatively smaller uplift which is closely related to the Wisconsin Arch in age. Pirtle (1932) proposes that the Kankakee Arch is a southeastward continuation of the Precambrian deformation that formed the Wisconsin Arch. Lockett (1947) does not agree with Pirtle, and proposes that the arches are not related because of difference in elevation of the two arches at their junction. Lockett further proposes that the Kankakee Arch is divided by the Logansport sag, and the eastern portion, referred to as the Wabash spur, might be related to the Cincinnati arch.

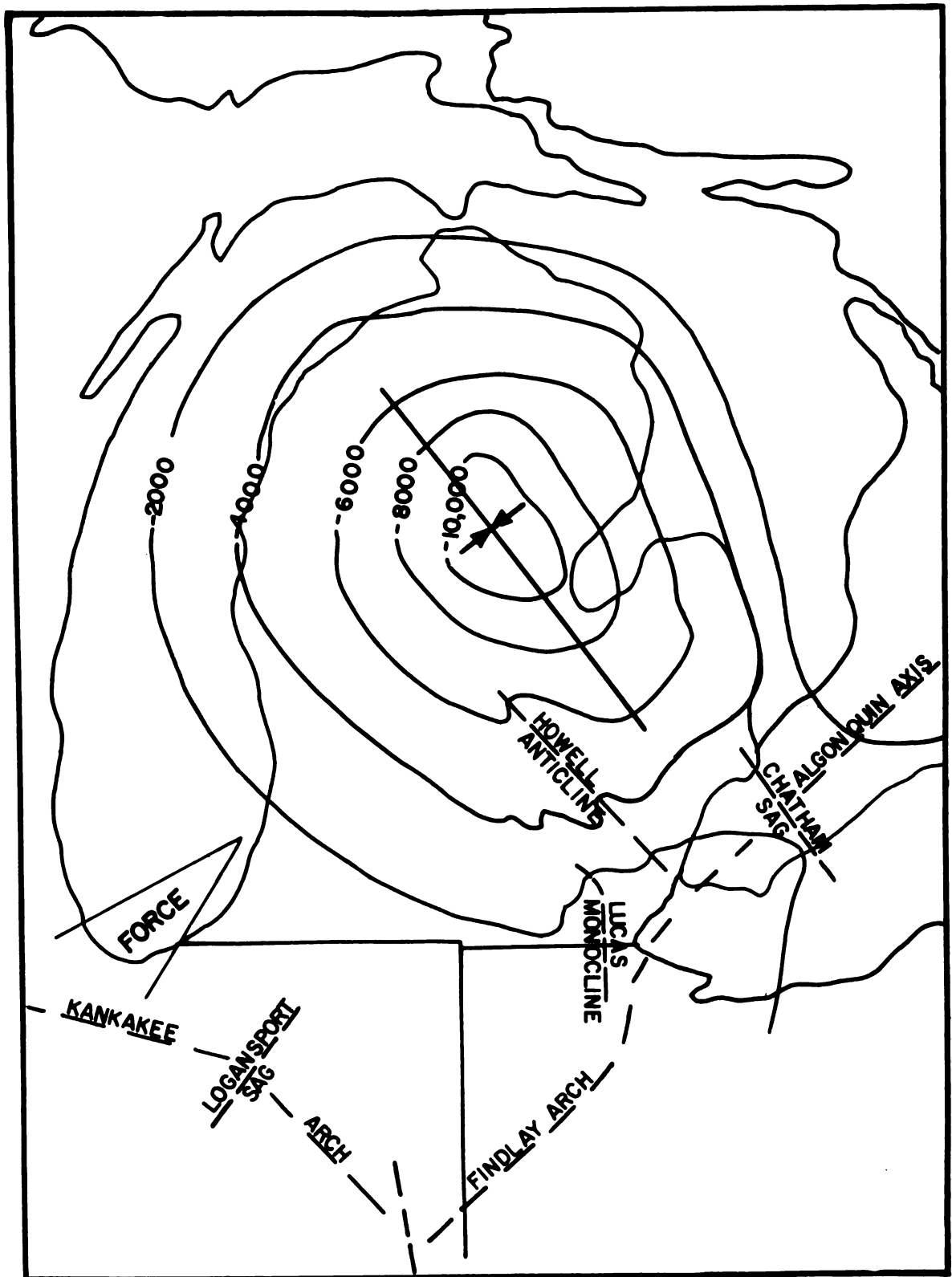


Figure 5. TRENTON STRUCTURE (PIRTLE,32)



**Figure 6. STRUCTUAL ELEMENTS OF THE MICHIGAN BASIN AREA
(LOCKETT,47)**

The formation of the Cincinnati Arch began as early as the Lowville stage of Middle Ordovician time, but the northern portion did not develop until the Cincinnati Epoch of Upper Ordovician time. As a result of the Appalachian Orogeny starting to develop in Mississippian time, the Cincinnati Arch becomes a strongly positive feature bringing about a more symmetrical Michigan Basin, (Newcombe, 1934).

A very early mountain chain that extended from Canada to northwest Ohio was probably an extension of the Cincinnati Arch, and is reflected in the younger sediments as the Findlay Arch and Algonquin axis. The Findlay Arch and Algonquin axis are separated by the Chatham sag, which was formed in post Middle Ordovician time, (Lockett, 1947). The Algonquin axis, according to Sanford and Quillian (1957), has no relation to the Findlay Arch but is said to be an isolated basement high rather than an extension of the early mountain chain forming the Findlay Arch.

The structural features of the Canadian Shield region, together with the major structural features flanking the southern portion of the Michigan Basin, set the geologic framework for the Michigan Basin and to a large extent control the development of smaller structural features and fracture systems within the basin.

Theories Relating to "Trend" Structures in the Michigan "Basin"

As shown in Figure 5, many structural features of the Michigan Basin parallel a northwest - southeast direction. A few of these subsurface features are 40 to 60 miles long and 200 to 300 feet in relief. Stronger features such as the Howell Anticline have a relief of approximately 1,000 feet. The Albion - Scipio Field parallels this same northwest - southeast direction of deformation that is prominent in the

Michigan basin. Many theories have been proposed to explain the development of these structurally aligned features. Prevailing opinion is that the origin of principal structures now existing in later sediments are controlled by intermittent movement along old trends of folding or lines of structural weakness which exist in the basement rocks and are closely related to the early history of the basin itself, (Newcombe, 1934) (Pirtle, 1932) (Lockett, 1947). Causes for the deformation of the Precambrian basement differ widely from: lateral orogenic forces (Pirtle, 1932); torsional twisting and tearing (Newcombe, 1934); to basin subsidence (Lockett, 1947).

According to Pirtle (1932), the orogenic force that formed the system of Precambrian mountains, presently the Wisconsin and Kankakee Arches, formed the Michigan Basin originally as a part of a long, broad geosyncline paralleling these old mountains. The oblong trend of the basin is more evident in older formations while the younger series reveal a more circular form. The highly folded metamorphic rocks and lines of structural weakness underlying the basin, formed at the time of the geosyncline would closely parallel its axis of elongation. Horizontal compression, active during successive periods of deposition, reflected deformation in accumulating sediments along these old lines of structural weakness and folding.

Newcombe (1934) proposed that the Michigan Basin formed prior to Keweenaw time. In post Keweenaw time, an orogenic force from the northeast to easterly direction deformed the basin, resulting in an asymmetrical basin with the steep flank to the northeast. The basin continued to warp downward until Mississippian time. The lateral force of the developing Appalachian orogeny extended as far as the Cincinnati Arch

and brought about a more symmetrical basin. This changed the axis of downwarp, and therefore the depocenters are not aligned. The downwarping of the basin, a changing vertical force with horizontal forces applied from diametrically opposite directions, would cause torsion, and shearing would result. The exact movement would probably be a torsional downbending taking place along lines of pre-existing weakness. Northwest - southeast trending anticlines in the Michigan Basin that are asymmetrical with a steep or faulted southwest flank would be an example of this type of movement.

Lockett (1947) suggests that the general structural features bordering the southern part of the Michigan Basin, in Precambrian time, were mountain ranges of a magnitude similar to the Alps, Alleghenies or Rockies. These mountain highs were the original mass to be deposited in the basin and start the downwarping of otherwise positive features. The downwarping continued in the three basins, (Michigan, Illinois and Pittsburgh - Huntington basins) with the increasing accumulation of sediments. The basins were separated only by the positive regional arches. Then this downwarping force separated the Kankakee Arch and Findlay Arch at the shortest distance between the basins and formed the Logansport sag and Chatham sag respectively.

"The division of the original Kankakee-Wabash axis with the bilateral shift toward each basin is an indication of the extent of the tension stress which accompanied the downwarp of this arch under the weight of accumulated sediments on either side." (Lockett, 1947)

The Chatham sag is developed in much the same way. The Michigan Basin and the Pittsburgh - Huntington basin are connected by a syncline. The junction of this syncline, shown in Figure 6 and the Findlay-Algonquin axis, causes a depression of the axis of probably over 2,000 feet.

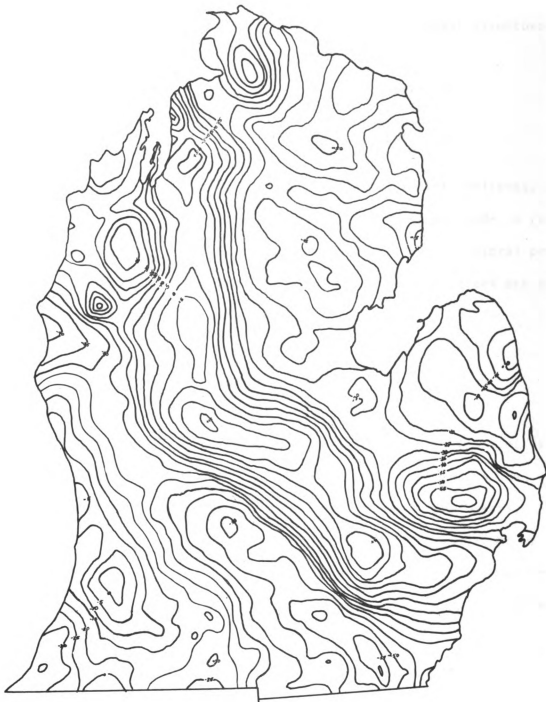


Figure 7. BOUGUER GRAVITY ANOMALY MAP
(Michigan Geological Survey, 63)
contour interval 5 milligal

This structural depression referred to as the Chatham sag developed in post Ordovician time. The Chatham sag, because of its magnitude, becomes the main factor in establishing northwest - southeast structural features. According to Lockett (1947):

"A system of fractures or lines of weakness develop in the basal complex through the unsupported end (Chatham sag area), and parallel with northeast and southwest sides of the basin which remained positive."

Structural features, such as the Howell Anticline, Lockett believes, are not created by orogenic forces when considering their magnitude in relation to the basin. An actively forming fold absorbs the lateral pressures which caused it; therefore, presumable deformation forces are not transmitted. Lockett (1947) proposes that:

"Michigan lines of structural trends conform to primary fractures thus produced. The basic lines of weakness under the basin may therefore be considered as a result of simple subsidence."

The most recent interpretation of the Michigan Basin basement is based on geophysical studies (Figure 7). Structural trends in the northern part of the basin are north-south rather than northwest-southeast. This was also noted by Newcombe (1934), but explained by differential compaction and subsidence rather than basement structure. According to Hinze (1964), the southeast quarter of the Michigan Basin has been relatively active, structurally.

STRATIGRAPHY

General

The stratigraphy sequence encountered in the Albion - Scipio Field includes rocks of the Cambrian, Ordovician, Silurian, Devonian, Mississippian and Pennsylvanian systems. Figure 8 shows a general stratigraphic section along the Albion - Scipio Field. Variable or average thicknesses recorded in the chart pertain only to the area of investigation and do not necessarily apply to the stratigraphic sequence for the Michigan Basin. Generally, most formations dip northward to northeastward at about 50 feet per mile. Most of the formations increase in thickness northward toward the center of the basin as shown on Plate I. The Niagaran Series is an exception and thins basinward. According to Ellis (1962):

"The rocks of Middle and Late Silurian age are of special significance since the former are believed to be a reef and biostrome complex and the latter largely a marine evaporite sequence. The Niagaran Series is thickest in the shelf regions of the basin and thins basinward. The upper part of the Niagaran, sometimes called Guelph - Lockport, has been identified with reef and inter-reef facies of a regional reefal complex which is concentrated around the margins of the Michigan Basin."

In Lee Township there are at least two Niagaran pinnacle reefs associated with the field. One reef to the northeast produces oil from a single well and the other pinnacle reef to the southwest produces gas from one well.

Southward along the field and toward the shelf region of the basin,

STRATIGRAPHIC CHART OF FORMATIONS ENCOUNTERED IN THE ALBION-SCIPIO FIELD

NOMENCLATURE		PRINCIPAL LITHOLOGY	VARIABLE THICKNESS
RECENT		DRIFT	0' - 300'
PLEISTOCENE			
MISSISSIPPIAN	MARSHALL SS.	SANDSTONE SILTSTONE	0' - 160'
	COLDWATER	SHALE	900' - 1050'
	SUNBURY	BLK. SHALE	10' - 20'
	BEREA	SILTSTONE	30' - 40'
	BEDFORD	SHALE	30' - 40'
	ANTRIM	SHALE	190' - 215'
	TRAVERSE GP "TRAVERSE FM."	SHALE	30' - 40'
	"TRAVERSE LIME"	LIMESTONE SHALY LS. CHERTY LS.	175' - 200'
	DUNDEE	LIMESTONE	25' - 35'
	DETROIT RIVER GP LUCAS FM. AMERSTBERG	DOLOMITE & THIN ANHYDRITE	265' - 300'
DEVONIAN	SYLANIA SS.	SANDY DOLO.	10' - 30'
	BOIS BLANC FM.	DOLOMITE	0 - 25'
	BASS ISLAND FM.	DOLOMITE	0 - 125'
	GUELPH-LOCKPORT	SHALE DOLOMITE SOME ANHY.	425' - 500'
	CLINTON	DOLOMITE	300' - 425'
	CATARACT FM.	SHALE & DOLO.	100' - 115'
	RICHMOND	SHALE DOLOMITE	340' - 350'
	UTICA	SHALE	320' - 330'
	TRENTON	LIMESTONE	340' - 360'
	BLACK RIVER	LIMESTONE	230' - 360'
SILURIAN	GLENWOOD	SANDY SH. SANDSTONE	10' - 50'
	ST. PETER		
	PRAIRIE DU CHIEN GROUP	DOLOMITE SANDY DOLO.	50' +
ORDOVICIAN			

FIGURE 8. (adopted from Ives, 1960)

the lower part of the Salina formation thins, pinches out and rests unconformably on the Niagara Series, as shown in Plate I. The Late Silurian, Bass Islands formation and the Early Devonian, Bois Blanc formation, also thin, pinch out and rest unconformably on the G- unit of the Salina formation. The first bedrock encountered in drilling is Mississippian in the south part of Albion - Scipio, and Pennsylvanian to the north. Then successively younger and truncated series are encountered toward the center of the basin. As shown on Plate I, the remaining formations have relatively continuous and conformable characteristics many of which can be correlated on gamma ray logs.

Middle Ordovician

The oldest rocks penetrated are those of the Lower Ordovician Prairie du Chien group. The members, in ascending order, of this group are the Oneota dolomite, the New Richmond sandstone and the Shakopee dolomite. Overlying the Prairie du Chien group is the Middle Ordovician St. Peter sandstone which is encountered in some wells. The relationship between the St. Peter sandstone and the Prairie du Chien Group is unconformable due to pre- St. Peter erosion of the Prairie du Chien group. The St. Peter sandstone is a white to brown, predominantly pure, friable sandstone with fragmental chert and pyrite locally common.

The Glenwood shale, overlying the St. Peter sandstone, is a green-gray calcareous shale. The shale is usually sandy and pyritic. The sand grains found within the shale have the general characteristics of the underlying St. Peter sandstone. The Glenwood shale, sometimes referred to as the basal member of the Black River formation, is correlated with the Glenwood of Wisconsin.

The Black River formation conformably overlies the Glenwood shale and is principally a brown to gray crystalline limestone containing interbedded dolomite. The Black River limestone is considered to be finer grained and not as fossiliferous as the over-lying Trenton limestone (Cohee, 1958). The Black River ranges from 230 to 360 feet in thickness. The Trenton and Black River limestones are separated by an argillaceous limestone and shale section. This section, which is approximately 3 feet thick, is often referred to as the Black River shale and is a characteristic marker bed over a large area.

The Trenton limestone lithology is very similar to that of the Black River limestone. The uppermost bed of the Trenton limestone consists of about five to ten feet of crystalline dolomite which is characteristic of this area. The Trenton is approximately 350 feet in thickness with little variation within the area. The Trenton limestone is overlain by the Upper Ordovician, Utica shale which is a thick sequence of gray to black, hard, fissile shale.

In the area of south-central Michigan, the Trenton - Black River formations generally consist of limestone and interbedded dolomite, which occurs in different proportions in different areas. Toward the west edge of the basin, as shown in Figure 9, the Trenton - Black River rocks are entirely dolomite. Along the margin of the basin and the Findlay and Kankakee Arches, they are limestone and dolomite. In the central portion of the Michigan basin, the Trenton - Black River rocks are entirely limestone. According to Cohee (1958), the oil and gas production is almost entirely limited to the area where the Trenton - Black River sequence is dolomite and limestone or is entirely dolomite.

The Trenton - Black River sequence thins slightly over the Kankakee and Findlay Arches as shown in Figure 10. The greatest thickness is in the "thumb" area of Michigan and extends to Ontario, Canada indicating that the Chatham sag probably served as the first connection between the Michigan Basin and the seas to the east.

The structure of the Trenton - Black River, as shown in Figure 11, indicates the center of the basin near Clare and Gladwin Counties and 11,000 feet plus of structural relief.

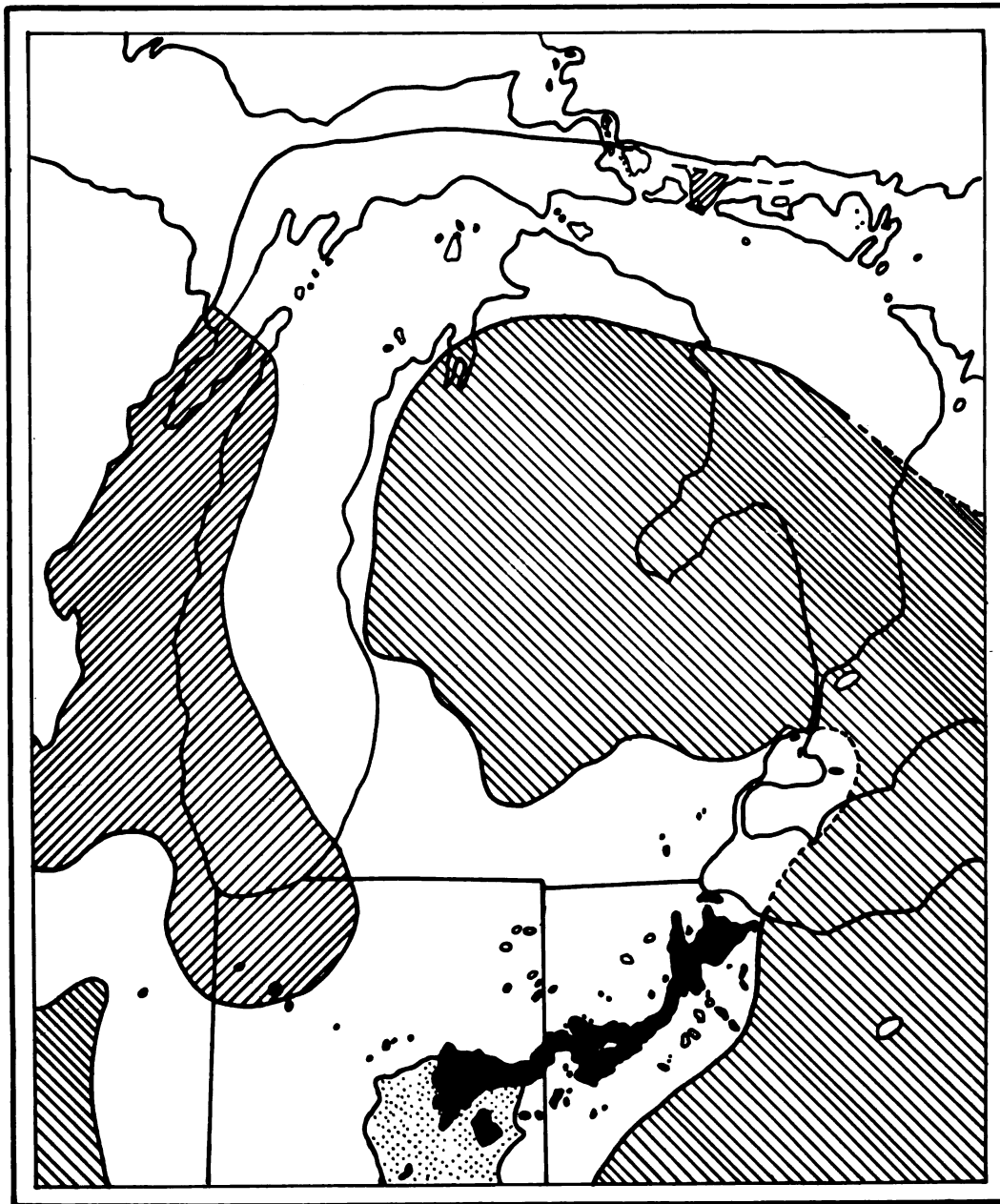


FIGURE 9. LITHOLOGY OF THE TRENTON AND BLACK RIVER LIMESTONES AND AREAS OF OIL AND GAS PRODUCTION FROM THESE ROCKS

(AFTER COHEE AND BURGESS, 1980)

- TRENTON AND BLACK RIVER LIMESTONES ENTIRELY DOLOMITE
- ⊗ TRENTON AND BLACK RIVER LIMESTONES ENTIRELY LIMESTONE
- ◐ TRENTON AND BLACK RIVER LIMESTONES GENERALLY DOLOMITE AND LIMESTONE
- AREA OF TRENTON OIL PRODUCTION, CHIEFLY IN LIMA-INDIANA FIELD
- ◑ AREA OF TRENTON GAS PRODUCTION
- ◐ AREA OF TRENTON OIL AND GAS PRODUCTION

SCALE
0 25 50 75 MILES

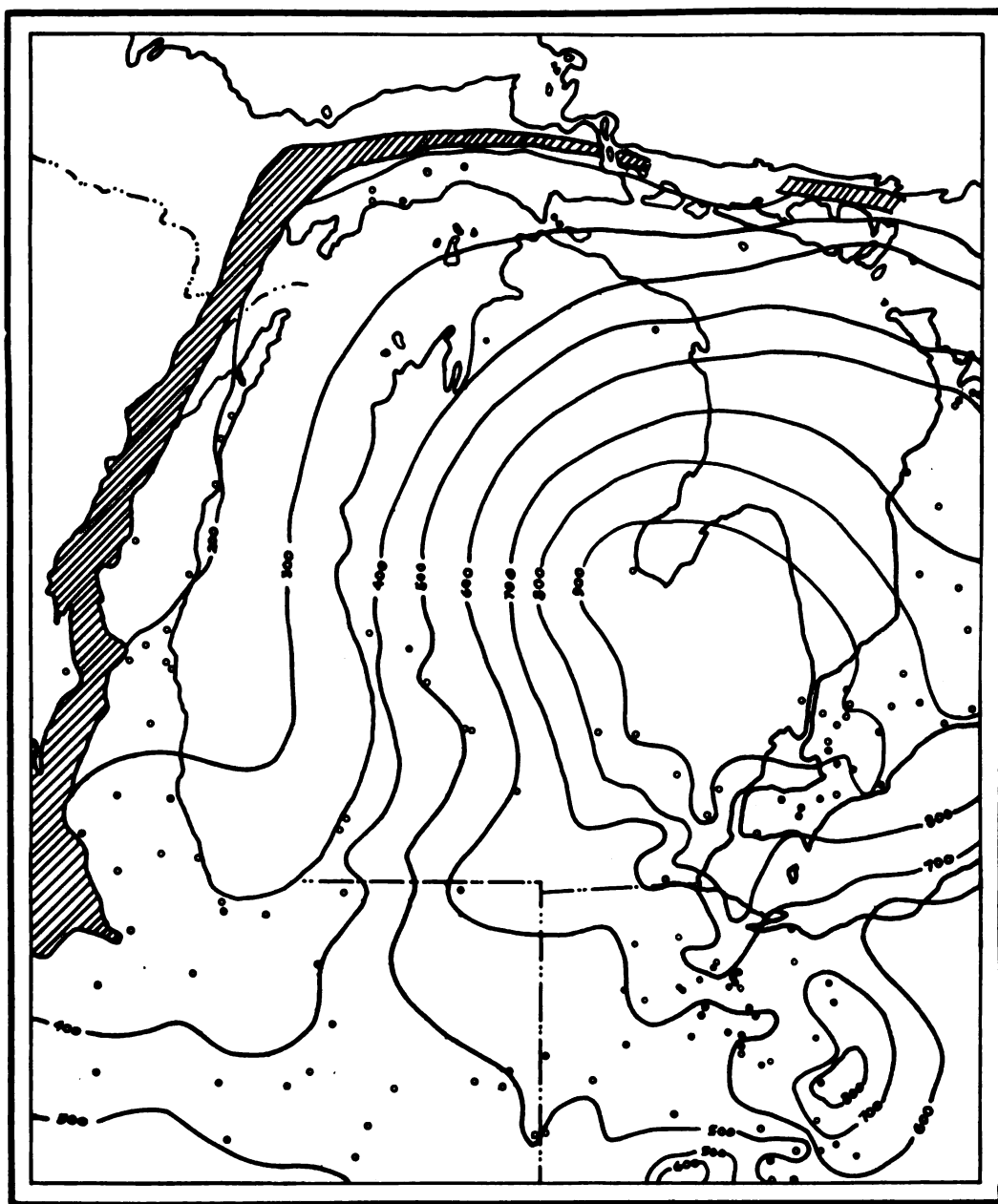


FIGURE 10. THICKNESS OF TRENTON AND BLACK RIVER ROCKS
(AFTER CONEE AND BURGESS, 1960)

EXPLANATION

Thickness interval 100ft.

▨ Area of Trenton and Black River outcrop

• Control point

scale
0 25 50 75 miles

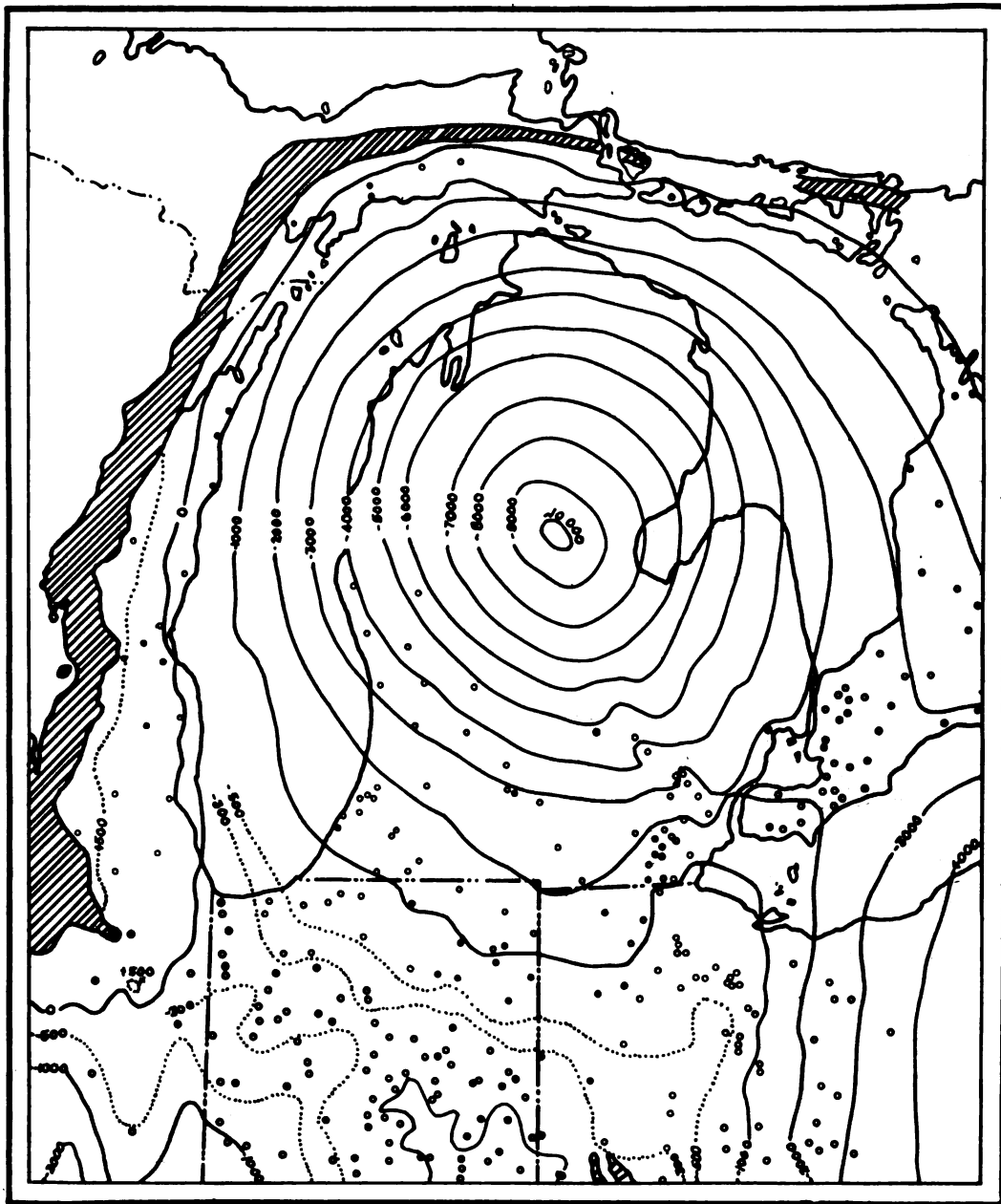


FIGURE II. CONTOURS ON TOP OF TRENTON LIMESTONE
(AFTER COHEE AND BURGESS, 1960)

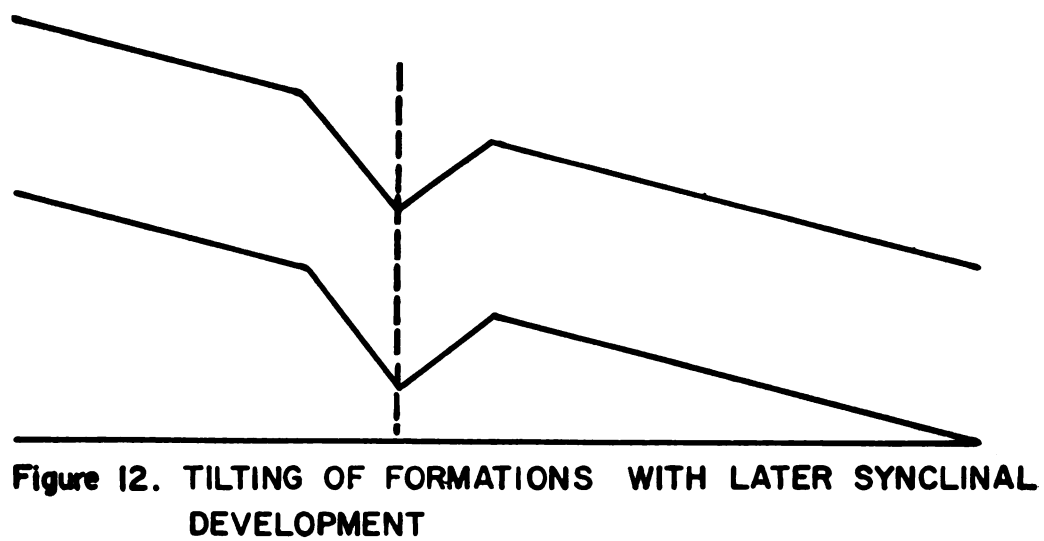
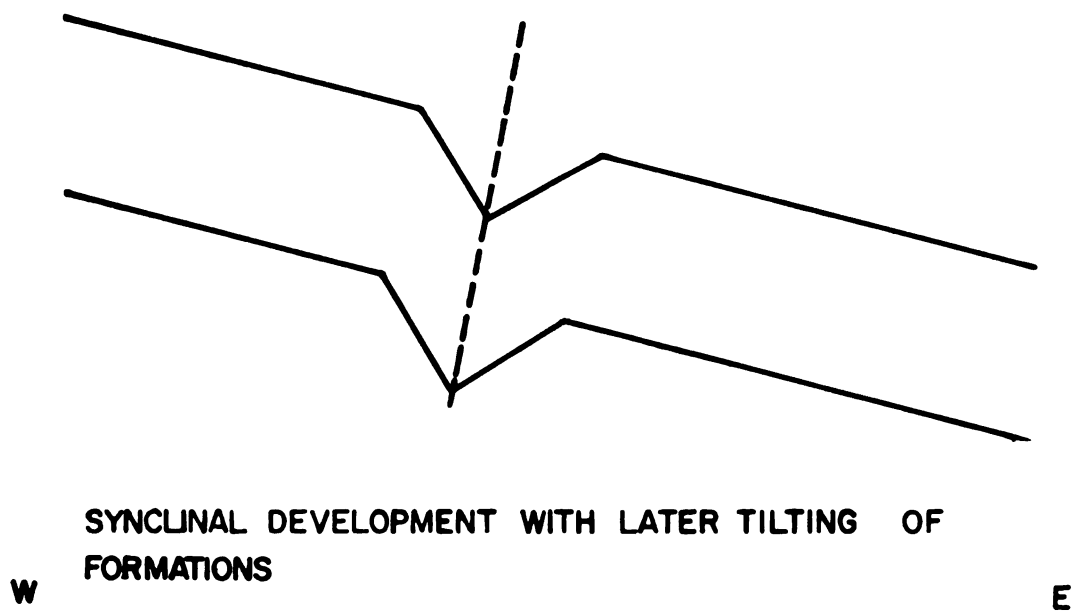
CONTOUR INTERVAL 1000 FT.

SCALE
0 25 50 75 MILES

LOCAL STRUCTURE

The formations in the Albion - Scipio Field area generally dip in a north to northeasterly direction. Structure contours on the top of the Trenton limestone, shown in Plate II, illustrate this regional dip. The Trenton limestone is the uppermost producing horizon, and therefore is the lowest unit penetrated generally by wells drilled in the area. Formation data correlated for this plate will be more extensive than the overlying or underlying formations. This is due to the lack of logging of formations other than the producing formation because of economics or lack of interest. Production from the Trenton - Black River is characterized by a structural depression or syncline. The depression trends in a northwest - southeast direction and varies in relief from a few feet with an average depth of 30 feet. The synclinal development is asymmetrical (Figure 12). The steep slope is to the northeast, and the gentle slope is to the southwest side of the field. The appearance of the "anticlinal nose," or high, paralleling the northeast side of the field is due to the angle at which the vertical axis of the syncline strikes across the regional dip. This depression or syncline is associated with the production of oil and gas from the fractured Trenton - Black River limestone which is subsequently dolomitized and develops porosity.

The depression is strongly developed and continuous in the Trenton limestone except where it is displaced by a fault in Pulaski Township. The writer proposes that this fault is a low magnitude fault which is mainly strike slip with a displacement of approximately one-half mile to the west. The fault presumably dips to the near vertical position with



a smaller component of downward movement on the north side of the fault. The dip of the depression increases to the north of the fault and the depression loses definition just north of the fault area. This type of fault, often referred to as a wrench fault has separated the otherwise continuous reservoir and has played an important role in the entrapment of the oil.

In the southern portion of the Albion - Scipio Field the syncline becomes poorly defined and discontinuous. A large high area in Adams and Fayette County may have an effect on field development, Plate II.

The structure contour map of the "Clinton" formation as shown in Plate III illustrates a similar syncline development over the Albion - Scipio Field. In many areas the magnitude of the depression is approximately similar to that shown by the Trenton, but generally the depth of the syncline is slightly less. The steep northeast side of the syncline is still present indicating presumably a vertical origin of the syncline after the tilting of the formations. The fault in Pulaski Township is still present. The characteristics of the fault are similar except for a possible decrease in magnitude of vertical displacement. The structural high in Adams and Fayette is present on the Clinton map as it was on the Trenton map. In general the structure of the Trenton limestone and the Clinton formation are approximately identical.

In the course of the geologic sequence of formation development, the Albion - Scipio syncline would have been subject to sedimentation and a filling of the syncline. At such time, barring further subsidence the syncline would not appear in later formations and, these formations would be preceded by thickening in the synclinal area. The structure of the top of the Traverse limestone (Upper Devonian) as shown in

Plate IV illustrates this general absence of the Albion - Scipio syncline. There are a few remnants of the syncline expressed as local depressions in some areas, but generally synclinal trend is no longer present.

In Albion Township (T35,R4W,Sec.14 and 15) the formation of a low relief anticline has developed in contrast to possible syncline development. The small amount of closure that exists in this area, has produced gas in a dolomitized section of the Traverse limestone. This field, now shown by four abandoned gas wells, was the old Albion Gas Field which was discovered in 1941.

The structure of the Sunbury formation, as shown on Plate V, has still fewer remnants of the former synclinal depressions expressed as local structural lows. The structural high of the Albion Gas Field has become a more positive feature in Mississippian time.

In summary of local structural conditions in the Albion - Scipio Field, it can be illustrated that the formation of the linear syncline or depression developed after the regional tilting of formations. The structural development was also post-Clinton and pre-Mississippian. During the Mississippian period small local synclines and anticlines developed in this area.

LOCAL VARIATIONS OF ISOPACH INTERVAL

Shown in Plate VI is the thickness of the interval from the top of the Trenton limestone to the top of the Black River Shale. This plate illustrates two concepts of major importance to the development of the Albion - Scipio Field. The first concept is that of reservoir fluid relationships which will be reviewed on page 35. The second concept is that of volume reduction due to dolomitization. The Trenton limestone shows a definite thinning over the linear synclinal area. Well penetration is largely controlled by the level of oil in two major reservoirs. Wells penetrating the Black River Shale are located generally in two areas where the oil - gas interface is below the Trenton limestone. The interval in question averages about 350 feet thick and an approximate maximum thinning of 8-9% of this sequence would be needed to produce a syncline of an average depth of 30 feet. The thinning that occurs ranges from 0% to 11% with an average maximum thinning of approximately 4%. The writer is of the opinion that if this rate of thinning is extended to the entire Trenton - Black River sequence, then the synclinal development is primarily due to solution, dolomitization, volume reduction, and subsequent thinning.

Solutions entering the formation by way of a fracture zone may dissolve calcium carbonate. If this solution contained a sufficient proportion of magnesium ion, dolomite might then be deposited. Even though this takes place molecule by molecule, this mechanism can be used to explain large areas of dolomitization, porosity and large vugs or solution

cavities lined with dolomite crystals. Therefore the loss of volume and subsequent thinning of the Trenton - Black River formations may be due to solution activity.

The top of the Clinton to the top of the Trenton interval is illustrated in Plate VII. This interval has local thinning and thickening with no definite pattern associated with possible deposition related to the synclinal depression developed in the Trenton limestone. It was illustrated previously that the Clinton structures are approximately similar to Trenton structures, and the thickness sequence further indicates that sedimentation was not influenced by pre-existing structures.

The Middle and Late Silurian rocks are believed to be a reef and biostrome complex (Ells, 1962). The thickness sequence of the interval from the top of the Niagara to the Clinton is shown on Plate VIII. This illustrates reef and biostrome characteristics as described by Ells. The area covering the largest portion of the Albion - Scipio is believed to be covered by a biostrome complex. In the shelf regions of the basin, probably extending as far as the north portion of Albion Township (T3S,R4W), the biostrome complex thickness may vary possibly due to local highs rather than structural lows. In the northern portion of Albion Township the sequence thins abruptly, illustrating the possible basinward limits of the biostrome environment. Beyond this area in a basinward direction the biostrome conditions change due to water depth and pinnacle reefs develop as illustrated in the extreme north portion of the field. The development of the biostromal covering over an extensive area of the field illustrates no thinning or thickening pattern which can be associated with pre-existing structural high or low areas of the syncline or depressional trough.

The deposition of sediments that follows shows that they are largely controlled by pre-existing Niagara biostromal and reef development. The Salina thickness sequence as shown on Plate IX illustrates local thinning over pre-existing Niagara highs, and local thickening over Niagara lows.

Evidence for the linear synclinal development which is associated with the Albion - Scipio Field is recorded primarily in Devonian time. Plate X illustrates a thickening relation of the interval from the top of the Traverse limestone to the top of the Salina formation, which is definitely related to the synclinal depression associated with the Albion - Scipio Field. Structural activity during the Devonian is also evident in Albion Township with the formation of the small anticlinal structure shown on Plate IV.

The lower Mississippian is shown on Plate XI by the thickness interval from the top of the Berea-Bedford formation to the top of the Traverse limestone. During this interval there is local thickening of sediments within the syncline and no large area of thickness is indicated which would suggest other than local synclinal developments.

In summary of local thickness variation the author proposes that the syncline or depression associated with the Albion - Scipio Field developed primarily in Devonian time.

RESERVOIR RELATIONSHIPS

The complexity of the relationship of dolomite and limestone in the Albion - Scipio Field has been revealed in detailed studies (O'Connell, 1958) (Kirschke, 1962) (Asseez, 1964). On the whole there is a distinctive increase of dolomite and decrease of limestone within the producing areas of the field as compared to edge wells of no production where little dolomite is encountered. A detailed study of a non-producing edge well indicates that presumably there is primary dolomite along bedding planes and secondary dolomite associated with fractures at an angle to the bedding planes (Asseez, 1964), but apparently not enough for petroleum production.

In the field the fractures are generally not of great magnitude and have little displacement. The dolomitizing waters moving into interconnected fractures have dolomitized the limestone to varying degrees. Porous zones such as fossil zones, originally present in the limestone, have definitely increased the amount of dolomitization activity, and interbedded shales have localized some of the dolomitization. Complete dolomite sections of the Trenton - Black River rock, in the Albion - Scipio Field, are not as numerous as compared to those sections containing limestone and dolomite (Ells and Ives, 1964). Apparently, there has not been a development of one major fault break down the length of the field. Had this occurred, one would expect a continuous dolomite zone down the length of such a fracture. A more plausible explanation is that there is a zone of small fractures down the length of the field where dolomitization has varied with the degree of fracturing.

The oil and gas production is related mainly to porosity developed

in dolomite sections. In some sections the dolomite has very little porosity, and as a consequence is barren of oil and gas. The overall porosity of dolomite sections is about five per cent, and the average permeability is between three and four millidarcys; however, this varies greatly with sections that have vugular porosity (Ives, 1960).

The position of oil-gas interfaces, and water contacts are, at least, at three different levels within the Albion - Scipio Field. Plate VI illustrates two levels of production by the distribution and depth of penetration of wells into the producing horizon. According to Smiley (1964), three levels of production exist in the Albion - Scipio Field. Bottom hole pressure surveys are conducted on three data by the Michigan State Geological Survey. These data are listed as follows:

- | | |
|---------------|--|
| Group No. I | (Datum - 2850 feet) includes all of the area south of the center of Pulaski Township. |
| Group No. II | (Datum - 3150 feet) includes all of the field area north of the center of Pulaski Township, except Lee Township. |
| Group No. III | (Datum - 3820 feet) includes only Lee Township. |

The positions of these data are illustrated in Figure 13. These data are the closest approximation to the center of oil producing zones. These zones are separated by dry wells penetrating dense limestone sections in the Trenton - Black River rocks. The writer suggests that these production zones are separate reservoirs which are characterized by low pressure pumping wells in the northern area of each reservoir and high pressure flowing wells in the southern portion of each reservoir.

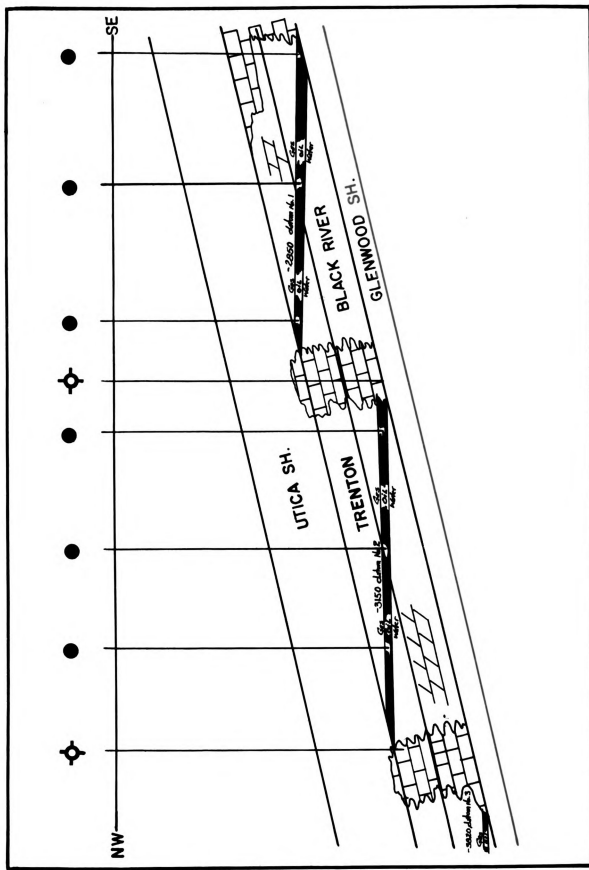


Figure 13

Pressure decline curves for each reservoir also show no communication between reservoirs.

FORMATION OF TRAP

As illustrated in Plates II through XI, the writer suggests that the main development of the Albion - Scipio Field occurred in Devonian time.

The nature of the reservoir rock prior to deformation was a denser, more crystalline limestone with local lenses of shale, fossil zones and interbedded primary dolomite. During Late Silurian or Early Devonian time, a shearing movement of the basement complex along a line of pre-existing weakness produced a long linear fracture zone in the Trenton - Black River limestone. There is little evidence of either vertical or horizontal movement, but horizontal movement is believed to be more likely. The nature of the fracture in the Trenton - Black River is that of a long highly fractured system which fades northward into small discontinuous fractures. To the south the fracture zone bifurcates and then fades into an irregular pattern. Shortly after the development of the fracture zone its continuity was broken by an east-west wrench fault in Pulaski Township. The north side of the east-west fault develops fracturing due to downward movement, and possibly the opposite side was stationary which thus escaped fracturing.

Dolomitization of the Trenton - Black River rocks took place during Devonian time. The resulting dolomitization produced porosity of varying degrees, and is controlled by the extent of connecting fractures and porous zones present in the rock. By the process of solution activity, the Trenton - Black River rocks thinned and this was a major factor in the development of the narrow linear synclinal depression. This depression has a vertical axis of downward movement, and when imposed on

the tilted formations will have a steep northeast slope. In cross section, this development was not uniform for the entire area, but depended on the relative amount of solution activity, dolomitization, and subsequent volume reduction. Dolomitization occurred in an east-west direction on the down-thrown side of the Pulaski Township fault. This later formed a favorable trap for fluids. This type of Trenton - Black River entrapment can be seen in the Dover Field of Canada and in the Bowling Green fault area of the Lima - Indiana Field. The down-thrown side of both of these areas has developed porosity in a similar manner, whereas the up thrown side is void of porosity if structures were not present before faulting occurred.

Oil migration into the trap is believed to be either a lateral or an ascending migration. A downward migration has been proposed with the source rock as the Utica shale, however, the Trenton limestone characteristically has a non-porous crystalline dolomite surface underlying the Utica shale and seemingly there would be little migration of fluids along this surface. The Trenton - Black River rocks contain organic material of sufficient amounts to warrant it as a source rock with lateral migration of fluids along porous zones into the trap.

One well, not directly associated with the field (T4S, R3W, Sec.28, SE SE NE) produced 40 barrels of oil per day from below the Glenwood formation. It would seem apparent that the source rock could exist below the Trenton - Black River rocks and that the oil has migrated from the lower source rocks up into the reservoir rocks.

The result of the loss of volume of the Trenton - Black River formation is expressed in the overlying formations as a settling effect into a forming low or linear depression. The formations above will reflect

this same linear depression with no thickening but during Devonian time the linear depression was filled with sediments and therefore is not present in Mississippian time. The axis of this syncline or depression is vertical from the Trenton formation to the Clinton formation, however, this may be obscured upward from the Clinton formation by the Niagara and Salina sequence as proposed by Ellis (1962).

Other limestone formations occurring within the Albion - Scipio fracture zone may undergo the same development as outlined above, and may accentuate the depression either below or above the Trenton - Black River formation. The Albion Gas Field located above the Albion - Scipio Field may be evidence of a similar fracture zone located in the same structurally weak area.

The extension of fracture zones in portions of the Albion - Scipio Field are still to be developed by drilling. Isolated fractures may still exist in the northern portion of the field. The connections of isolated production zones to the main oil pool are presently being developed. East-west extensions along the Albion - Scipio Field should be limited to the erratically fractured southern portion of the field.

Exploration for fields similar to the Albion - Scipio Field is very difficult. The presence of glacial drift complicates geophysical exploration and low linear relief features add to the difficulty of geologic exploration.

In the Michigan Basin other lines of structural weakness must exist. Movement along these lines may produce similar fields to the Albion - Scipio "Trend" and would suggest that they would parallel this prominent northwest-southeast direction characteristic in the Michigan Basin.

OTHER TRENTON PRODUCING AREAS

Michigan Trenton - Black River oil fields are distributed to the southern portion of the state. These fields are listed in Table 1, (and shown in Figure 14) which lists the fields by date of discovery, and shows relative importance of production. Such fields as Sumpter, New Boston, Springport, and Tekonsha are one and two well fields of which little can be determined other than that they have production of little significance from locally dolomitized portions of Trenton limestone.

The Northville, and Freedom Fields, shown in Figure 14, produce from the flanks of northwest-southeast trending anticlines. In the Northville Field, the discovery well produces 80% of the total production from the northeast flank of an anticline. This anticline appears to be directly associated with the Howell Anticline.

The Freedom Field is located on the west flank of an anticline that is possibly associated with the Lucas Monocline.

The Deerfield Field in Monroe County was discovered in 1920, but was not actively developed until 1937. The field still produces today with 22 active wells. Porous zones in the dolomitized portion of the Trenton limestone are located on the western flank of the northwest-southeast Deerfield Anticline which is associated with the Lucas Monocline.

The Hanover Field, (T4S, R2W), discovered in 1959, originally as a gas field which later unexpectedly changed to an oil field after sizable production of gas was drawn off. This field is close to the Albion -

Table 1.
SUMMARY OF MICHIGAN'S TRENTON OIL FIELDS*

<u>FIELD</u>	<u>DISC.-ABAND.</u>	<u>NO.WELLS</u>	<u>CUMM.OIL.PROD.</u>
Deerfield	1920 -	47	673,647 (bbls)
Sumpter	1941 -	2	?
New Boston	1943 - 1949	2	2,349
Freedom	1954 - 1956	1	7,217
Northville	1954 -	16	548,479
Albion-Scipio	1957 -	498	40,687,406
Hanover	1959 -	7	384,971
Tekonsha	1959 - 1963	1	2,698
Springport	1960 -	1	488

* Obtained from the Annual Statistical Summary of Michigan's Oil and Gas Fields, 1963; Geological Survey, Michigan Department of Conservation.

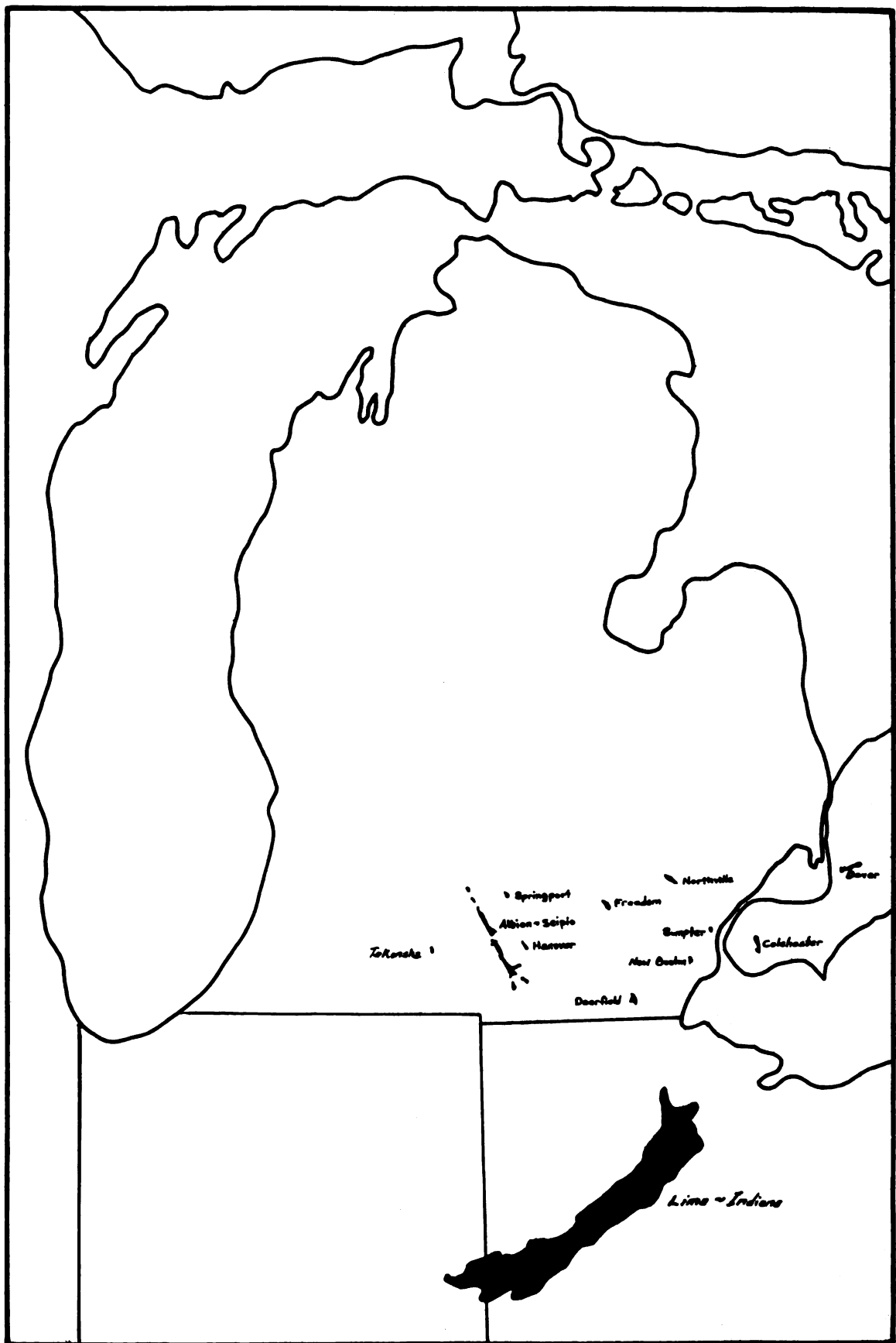


Figure 14. TRENTON-BLACK RIVER FIELDS

Scipio Field, T4S, R2W), and because it appears to be of similar type, northwest-southeast structure may be associated directly with the deformation of the Albion - Scipio Field. The Hanover Field is in the active drilling state of development which when completed will possibly show a relationship to the Albion - Scipio Field.

The Dover and Colchester Fields of Ontario, Canada have features similar to those of the Michigan, Albion - Scipio Field. The Colchester Field although north-south trending, has the same syncline development in the Trenton limestone with associated dolomitization, as does the Albion - Scipio Field (Burgess, 1962). The Colchester Field, discovered in 1959, and developed to six producing wells (1960), is a small structure, but nevertheless has developed apparently in a similar manner as the Albion - Scipio Field. The east-west trending Dover Field has developed porosity on the fractured dolomitized down-thrown side of a fault. This field produces oil and gas and was discovered in 1917. Similarities may be seen in this field, the Bowling Green fault area of the Lima - Indiana Field, and the fault in Pulaski Township of the Albion - Scipio Field. In each case production is developed on the fractured down-thrown side of the fault.

The oldest Trenton oil field is the Lima - Indiana Field. Discovered in 1884, it once produced 80% of the nations oil. The Lima - Indiana Field is a collective name for many small oil fields located in Ohio, and Indiana on the northern flank of the Findlay Arch. These fields are associated with three types of structures. In the Bowling Green Fault porosity is developed on the down thrown side of the faulted Trenton by fracturing and subsequent dolomitization. Porosity is also developed in low structure anticlines that occur basinward from the

flank of the Findlay Arch. Oil entrapment occurs in crests of anticlines and monoclines paralleling the flank of the Findlay Arch. In the southern portion of the Findlay Arch, gas and some small amounts of oil collected in the crest of the low domed Cincinnati Arch.

All of the previously mentioned Trenton - Black River formation oil fields have the characteristics of porosity with dolomitization that is in various ways structurally controlled.

CONCLUSIONS

The Albion - Scipio Field, Michigan's largest single oil producing field, exhibits a northwest-southeast trending syncline developed on the Middle Ordovician Trenton limestone. This northwest plunging syncline has approximately 30 feet of relief, and is directly associated with fracturing, solution activity, dolomitization, and the development of a porosity oil trap in the Trenton - Black River limestones. The Albion - Scipio Field was formed in Devonian time by a movement along lines of pre-existing weakness in the basement complex. The movement was reflected in the tilted Trenton - Black River limestones not as a single continuous fracture but as a system of fractures trending northwest-southeast. These fractures served as a channel way for solutions that dissolved the calcium carbonate and provided sufficient additional magnesium ions to make possible the precipitation of dolomite. This solution activity created an approximate 8-9% loss of volume of the Trenton - Black River limestone which created the subsidence in the Trenton - Black River formations. Devonian sedimentation filled the subsiding depression and it was no longer present after Devonian time. Oil migrated laterally from the Trenton - Black River formations into separate step leveled pools caused by a cross fault and forming the present Albion - Scipio Field.

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APPENDIX

Well Locations and Formation Tops

Well Locations and Formation Tops

All wells are listed in the order of Township, Range, Section, and State Permit Number.

Formation Tops are recorded in feet with respect to sea level.

Abbreviations

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SB.....	Sunbury formation
BB.....	Berea-Bedford formation
TL.....	Traverse limestone
SL.....	Salina formation (G-Unit)
NG.....	Niagara formation
CL.....	"Clinton" formation
TR.....	Trenton formation.
BR.....	"Black River Shale"
GW.....	Glenwood formation

LOCATION		STATE PERMIT				TL	SL	NG	CL	TR	BR	GW
T1S R4W	SEC. 32 C, SE SW	21895	-----	-----	-785	-1561	-2147	-2501	-3255	-3631	-----	-----
T1S R5W	SEC. 13 NW SE NE	23021	-557	-571	-870	-1614	-2286	-----	-----	-----	-----	-----
	SEC. 13 C, NW NE	23771	-572	-587	-890	-1666	-2339	-----	-----	-----	-----	-----
	SEC. 13 C, NE SE	24875	-558	-571	-870	-1634	-2349	-----	-----	-----	-----	-----
	SEC. 15 SE SW SE	22380	-532	-546	-852	-1612	-2290	-2591	-3325	-3701	-3945	-3945
	SEC. 15 SE SW SW	22578	-525	-540	-847	-1589	-2326	-2575	-3314	-3687	-3930	-3930
	SEC. 15 SE SE SW	23207	-530	-544	-850	-1578	-2243	-2590	-3324	-3699	-3943	-3943
	SEC. 16 SW SW NE	21772	-----	-----	-867	-1543	-2314	-2608	-3348	-3723	-----	-----
	SEC. 16 NW NW SE	23637	-531	-544	-858	-1547	-2294	-2597	-3334	-3708	-3949	-3949
	SEC. 16 NW NE SE	25163	-536	-550	-859	-1597	-2182	-2616	-3346	-3720	-----	-----
	SEC. 17 NE NE NE	24982	-553	-569	-881	-1634	-2341	-2616	-3351	-3722	-----	-----
	SEC. 22 SE NW SE	22108	-524	-537	-841	-1600	-2263	-2547	-3288	-3665	-3908	-3908
	SEC. 22 SE SE SE	22343	-519	-533	-836	-1575	-2256	-2542	-3283	-3660	-----	-----
	SEC. 22 NW SE SE	22526	-523	-537	-841	-1577	-2266	-2546	-3286	-3661	-----	-----
	SEC. 22 NW SW SE	22623	-513	-526	-830	-1555	-2250	-2545	-3276	-3654	-----	-----
	SEC. 22 SE NE SE	22726	-516	-529	-830	-1558	-2125	-2560	-3292	-3668	-----	-----
	SEC. 22 SE SW SE	22727	-512	-525	-829	-1552	-2234	-2536	-3277	-3654	-----	-----
	SEC. 22 SE NW SE	22798	-524	-537	-841	-1581	-2266	-2547	-3289	-3665	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 22 NW NW SE	22894	-----	-----	-838	-1572	-2258	-2553	-3299	-3667	-----
SEC. 22 SE NE SW	22949	-510	-524	-831	-1537	-2253	-2538	-3278	-3654	-----
SEC. 22 NW SE SW	23779	-508	-523	-827	-1527	-----	-2543	-3270	-3647	-----
SEC. 22 SE NE NW	24009	-528	-542	-850	-1590	-2291	-----	-----	-----	-----
SEC. 22 SE NW SW	24278	-502	-515	-820	-1471	-2095	-2547	-3274	-3650	-----
SEC. 23 SE SW NW	22903	-529	-541	-845	-1613	-2296	-2570	-3310	-3688	-3932
SEC. 23 NW SW SW	23851	-518	-531	-833	-1576	-2253	-2553	-3292	-3669	-----
SEC. 24 NW SW SW	21627	-525	-539	-841	-1610	-2317	-2565	-3309	-3686	-----
SEC. 26 SE SE NW	22383	-498	-511	-813	-1480	-2276	-2532	-3273	-3648	-3893
SEC. 26 SE NE NW	22386	-513	-525	-828	-1581	-2296	-2541	-3281	-3656	-3902
SEC. 26 NW SE SW	22440	-486	-500	-801	-1453	-2262	-2530	-3268	-3646	-3890
SEC. 26 SE NW NW	22450	-506	-520	-821	-1552	-2284	-2549	-3284	-3659	-----
SEC. 26 SE SW NW	22783	-491	-504	-806	-1466	-2289	-2537	-3275	-3653	-3897
SEC. 26 NW SW SE	23020	-487	-499	-802	-1463	-2237	-2516	-3259	-3635	-3881
SEC. 26 NW NW SE	23232	-491	-505	-807	-1475	-2267	-2528	-3269	-3644	-3892
SEC. 26 NW SE SE	23896	-493	-505	-809	-1545	-2175	-2521	-3262	-3639	-3884
SEC. 26 NW NW SE	24985	-496	-506	-810	-1478	-2276	-2531	-3271	-3645	-----
SEC. 26 SE NW NW	25086	-504	-512	-819	-1553	-2283	-2540	-3281	-3655	-----

LOCATION		STATE PERMIT				TL	SL	NG	CL	TR	BR	GW
SEC. 35	NW SE SE	22835	-472	-485	-790	-1588	-2209	-2476	-3223	-3600	-3845	
T2S R4W												
SEC. 7	C S $\frac{1}{2}$ NW	23553	-----	-----	-750	-1609	-2144	-2425	-3187	-3562	-3807	
SEC. 18	SE SW SE	22412	-385	-397	-692	-1542	-2060	-2363	-3129	-----	-----	
SEC. 18	NW SW SE	22527	-392	-403	-699	-1549	-2068	-2371	-3133	-----	-----	
SEC. 18	NW NW SE	22592	-397	-408	-705	-1559	-2073	-2373	-3143	-3492	-----	
SEC. 18	C N $\frac{1}{2}$ SW	22785	-394	-406	-702	-1552	-2067	-2368	-3134	-3508	-----	
SEC. 18	SE SE SE	23064	-385	-398	-694	-1545	-2065	-2372	-3130	-3505	-3749	
SEC. 18	C of SW/4	24092	-386	-401	-696	-1542	-2037	-2362	-3121	-----	-----	
SEC. 18	C S $\frac{1}{2}$ NW W/4	24446	-398	-411	-708	-1549	-2067	-2371	-3139	-3514	-----	
SEC. 19	NW NE NE	22205	-----	-----	-686	-1532	-2046	-2363	-3127	-----	-----	
SEC. 19	NW SE NE	22473	-381	-394	-689	-1549	-2037	-2355	-3110	-----	-----	
SEC. 19	SE NE NE	22815	-----	-----	-703	-1551	-2065	-2376	-3136	-----	-----	
SEC. 19	SE NE SE	23757	-----	-----	-698	-1524	-2040	-2351	-3106	-3479	-3725	
SEC. 20	NW NW NW	21676	-377	-394	-687	-1539	-2082	-2368	-3125	-3498	-----	
SEC. 20	NW SW NW	22893	-390	-402	-697	-1543	-2051	-2376	-3128	-3503	-3746	
SEC. 20	NW SE NW	23982	-383	-398	-696	-1564	-2070	-2361	-3119	-----	-----	
SEC. 20	SE SW NW	24269	-387	-399	-699	-1550	-2067	-2368	-3125	-----	-----	
SEC. 20	NW NE SW	24402	-384	-397	-694	-1554	-2050	-2356	-3115	-3491	-----	

LOCATION	STATE	PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 20 SE SE NW	24473		-----	-----	-689	-1549	-2051	-2358	-3116	-----	-----
SEC. 20 SE NW SW	24728		-378	-392	-688	-1525	-2052	-2340	-3102	-3477	-----
SEC. 20 NW NW SE	25033		-----	-----	-689	-1536	-2049	-2350	-3108	-3485	-----
SEC. 20 NW SW NE	25096		-----	-----	-705	-1553	-2054	-2381	-3131	-3508	-----
SEC. 21 SE SE SW	23438		-----	-----	-694	-1497	-2043	-2319	-3086	-3463	-3709
SEC. 27 SE SE SE	21717		-376	-394	-693	-1389	-2000	-2295	-3064	-3441	-----
SEC. 28 SE SW SW	23032		-369	-385	-680	-1465	-2000	-2302	-3064	-----	-----
SEC. 29 NW SE SE	22584		-360	-376	-669	-1480	-2004	-2307	-3060	-3434	-----
SEC. 29 SE NE SE	23033		-367	-383	-677	-1491	-2006	-2306	-3066	-3440	-3687
SEC. 32 NW NW NE	2200		-360	-376	-671	-1466	-2000	-2283	-3042	-3413	-----
SEC. 32 SE NE SE	22754		-356	-373	-671	-1387	-1962	-2253	-3013	-----	-----
SEC. 33 SE NE NW	21964		-366	-384	-678	-1445	-2006	-2290	-3045	-3418	-----
SEC. 33 SE SW SE	22293		-360	-377	-687	-1441	-1987	-2286	-3041	-----	-----
SEC. 33 SE NW SE	22384		-360	-377	-682	-1454	-2003	-2287	-3050	-----	-----
SEC. 33 NW SE SE	22548		-361	-379	-686	-1450	-1996	-2279	-3041	-----	-----
SEC. 33 SE SE NW	22628		-361	-379	-679	-1437	-2006	-2289	-3049	-----	-----
SEC. 33 NW SW SE	22690		-354	-372	-675	-1438	-1991	-2276	-3029	-3400	-3652
SEC. 33 NW SE NW	22694		-362	-378	-676	-1433	-1984	-2286	-3043	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 33 NW NW SE	22736	-361	-379	-682	-1400	-1996	-2295	-3053	-----	-----
SEC. 33 SE NW NW	22748	-362	-378	-674	-1441	-2005	-2287	-3047	-----	-----
SEC. 33 SE SE SE	22806	-354	-372	-677	-1423	-1982	-2272	-3033	-----	-----
SEC. 33 NW NW NW	22837	-365	-379	-674	-1452	-2000	-2291	-3047	-----	-----
SEC. 33 NW NE SW	22966	-358	-375	-676	-1419	-1983	-2277	-3038	-3409	-3655
SEC. 33 NW NE SE	23001	-356	-373	-676	-1442	-1987	-2272	-3038	-----	-----
SEC. 33 NW SW NE	23117	-364	-381	-682	-1441	-2001	-2284	-3052	-----	-----
SEC. 33 NW NE NW	23457	-370	-386	-681	-1458	-2003	-2296	-3056	-----	-----
SEC. 33 SE SW NE	23510	-356	-372	-672	-1440	-1981	-2274	-3032	-3406	-3651
SEC. 34 SE NE SW	21825	-355	-372	-672	-1415	-1957	-2262	-3023	-3397	-----
SEC. 34 NW NW SW	22053	-357	-372	-656	-1435	-1986	-2262	-3028	-3402	-3651
SEC. 34 SE SW SW	23369	-342	-360	-660	-1417	-1953	-2200	-3010	-3383	-3431
SEC. 34 NW SW SW	23370	-347	-363	-663	-1418	-1961	-2253	-3016	-3389	-3643
T2S R5W SEC. 1 SE NW NW	22723	-476	-488	-790	-1617	-2207	-2465	-3216	-3593	-3839
SEC. 1 NW NW SE	25054	-469	-481	-780	-1562	-2202	-2462	-3214	-3590	-3836
SEC. 6 SE SE SE	21638	-416	-429	-749	-1553	-----	-2355	-3093	-3466	-----
SEC. 11 SE NE NE	22683	-429	-440	-748	-1557	-2114	-2417	-3160	-3535	-----
SEC. 12 NW NW NE	22880	-----	-----	-760	-1590	-2155	-2447	-3190	-3566	-3811

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 12 SE NE SW	23680	-431	-443	-744	-1569	-2085	-2403	-3156	-3529	-3774
SEC. 12 NW SE NW	23746	-----	-----	-754	-1570	-2069	-2407	-3175	-3549	-3794
SEC. 13 SE SE SE	22415	-----	-----	-707	-1538	-2046	-2350	-3116	-3489	-3732
SEC. 13 SE SE NE	22992	-398	-412	-709	-1549	-2051	-2375	-3137	-3510	-----
SEC. 13 SE NE NE	24185	-402	-416	-711	-1559	-2075	-2383	-3147	-----	-----
SEC. 13 NW NE SE	25983	-----	-----	-708	-1540	-2043	-2363	-3130	-3503	-3749
SEC. 30 SE SE SE	21991	-----	-----	-644	-1275	-----	-2179	-2913	-3285	-3527
SEC. 30 SW NE NE	23807	-361	-371	-676	-1313	-----	-2210	-2946	-3318	-3554
T2S R4W SEC. 7 C S $\frac{1}{2}$ NW	23553	-----	-----	-750	-1609	-2144	-2425	-3187	-3562	-3807
SEC. 18 SE SW SE	22412	-385	-397	-692	-1542	-2060	-2363	-3129	-----	-----
SEC. 18 NW SW SE	22527	-392	-403	-699	-1549	-2068	-2371	-3133	-----	-----
SEC. 18 NW NW SE	22592	-397	-408	-705	-1559	-2073	-2373	-3143	-3492	-----
SEC. 18 C N $\frac{1}{2}$ SW	22785	-394	-406	-702	-1552	-2067	-2368	-3134	-3508	-----
SEC. 18 SE SE SE	23064	-385	-398	-694	-1545	-2065	-2372	-3130	-3505	-3749
SEC. 18 C SW/4	24092	-386	-401	-696	-1542	-2037	-2362	-3121	-----	-----
SEC. 18 C S $\frac{1}{2}$ NW W/4	24446	-398	-411	-708	-1549	-2067	-2371	-3139	-3514	-----
SEC. 19 NW NE NE	22205	-----	-----	-686	-1532	-2046	-2363	-3127	-----	-----
SEC. 19 NW SE NE	22473	-381	-394	-689	-1549	-2037	-2355	-3110	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 19 SE NE NE	22815	-----	-----	-703	-1551	-2065	-2376	-3136	-----	-----
SEC. 19 SE NE SE	23757	-----	-----	-698	-1524	-2040	-2351	-3106	-3479	-3725
SEC. 20 NW NW NW	21676	-377	-394	-687	-1539	-2082	-2368	-3125	-3498	-----
SEC. 20 NW SW NW	22893	-390	-402	-697	-1543	-2051	-2376	-3128	-3503	-3746
SEC. 20 NW SE NW	23982	-383	-398	-696	-1564	-2070	-2361	-3119	-----	-----
SEC. 20 SE SW NW	24269	-387	-399	-699	-1550	-2067	-2368	-3125	-----	-----
SEC. 20 NW NE SW	24402	-384	-397	-694	-1554	-2050	-2356	-3115	-3491	-----
SEC. 20 SE SE NW	24473	-----	-----	-689	-1549	-2051	-2358	-3116	-----	-----
SEC. 20 SE NW SW	24728	-378	-392	-688	-1525	-2052	-2340	-3102	-3477	-----
SEC. 20 NW NW SE	25033	-----	-----	-689	-1536	-2049	-2350	-3108	-3485	-----
SEC. 20 NW SW NE	25096	-----	-----	-705	-1553	-2054	-2381	-3131	-3508	-----
SEC. 21 SE SE SW	23438	-----	-----	-694	-1497	-2043	-2319	-3086	-3463	-3709
SEC. 27 SE SE SE	21717	-376	-394	-693	-1389	-2000	-2295	-3064	-3441	-----
SEC. 28 SE SW SW	23032	-369	-385	-680	-1465	-2000	-2302	-3064	-----	-----
SEC. 29 NW SE SE	22584	-360	-376	-669	-1480	-2004	-2307	-3060	-3434	-----
SEC. 29 SE NE SE	23033	-367	-383	-677	-1491	-2006	-2306	-3066	-3440	-3687
SEC. 32 NW NW NE	22000	-360	-376	-671	-1466	-2000	-2283	-3042	-3413	-----
SEC. 32 SE NE SE	22754	-356	-373	-671	-1387	-1962	-2253	-3013	-----	-----

LOCATION	STATE	PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 33 SE NE NW	21964	-366	-384	-678	-1445	-2006	-2290	-3045	-3418	-----	-----
SEC. 33 SE SW SE	22293	-360	-377	-687	-1441	-1987	-2286	-3041	-----	-----	-----
SEC. 33 SE NW SE	22384	-360	-377	-682	-1454	-2003	-2287	-3050	-----	-----	-----
SEC. 33 NW SE SE	22548	-361	-379	-686	-1450	-1996	-2279	-3041	-----	-----	-----
SEC. 33 SE SE NW	22628	-361	-379	-679	-1437	-2006	-2289	-3049	-----	-----	-----
SEC. 33 NW SW SE	22690	-354	-372	-675	-1438	-1991	-2276	-3029	-3400	-3652	-----
SEC. 33 NW SE NW	22694	-362	-378	-676	-1433	-1984	-2286	-3043	-----	-----	-----
SEC. 33 NW NW SE	22736	-361	-379	-682	-1400	-1996	-2295	-3053	-----	-----	-----
SEC. 33 SE NW NW	22748	-362	-378	-674	-1441	-2005	-2287	-3047	-----	-----	-----
SEC. 33 SE SE SE	22806	-354	-372	-677	-1423	-1982	-2272	-3033	-----	-----	-----
SEC. 33 NW NW NW	22837	-365	-379	-674	-1452	-2000	-2291	-3047	-----	-----	-----
SEC. 33 NW NE SW	22966	-358	-375	-676	-1419	-1983	-2277	-3038	-3409	-3655	-----
SEC. 33 NW NE SE	23001	-356	-373	-676	-1442	-1987	-2272	-3038	-----	-----	-----
SEC. 33 NW SW NE	23117	-364	-381	-682	-1441	-2001	-2284	-3052	-----	-----	-----
SEC. 33 NW NE NW	23457	-370	-386	-681	-1458	-2003	-2296	-3056	-----	-----	-----
SEC. 33 SE SW NE	23510	-356	-373	-672	-1440	-1981	-2274	-3032	-3406	-3651	-----
SEC. 34 SE NE SW	21825	-355	-372	-672	-1415	-1957	-2262	-3023	-3397	-----	-----
SEC. 34 NW NW SW	22053	-357	-372	-656	-1435	-1986	-2262	-3028	-3402	-3651	-----

LOCATION		STATE	PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
T3S R3W	SEC. 34 SE SW SW	23369	-342	-360	-660	-1417	-1953	-2200	-3010	-3383	-3431	
	SEC. 34 NW SW SW	23370	-347	-363	-663	-1418	-1961	-2253	-3016	-3389	-3643	
	SEC. 5 NW SE NE	22742	-379	-396	-699	-1390	-1845	-2273	-3056	-3431	-3691	
	SEC. 17 C SE SE	21778	-----	-----	-588	-1258	-1730	-2128	-2907	-3282	-----	
	SEC. 19 SE SW SW	24449	-261	-279	-566	-1191	-1641	-2085	-----	-----	-----	
	SEC. 20 SE SE SW	19699	-277	-292	-571	-1195	-----	-----	-----	-----	-----	
	SEC. 22 NW NE SW	22674	-287	-303	-595	-1191	-1667	-2129	-2916	-3291	-3502	
	SEC. 25 SE NW SW	21601	-----	-----	-576	-1174	-1643	-2102	-2901	-3273	-3535	
	SEC. 25 NW SE SE	22306	-----	-----	-581	-1197	-----	-2103	-2908	-3282	-3545	
	SEC. 30 SE SE NW	22351	-----	-----	-544	-1158	-1646	-2059	-2834	-3205	-3459	
T3S R4W	SEC. 33 SW SW NW	19611	-238	-256	-539	-1181	-1645	-2031	-2812	-3181	-3436	
	SEC. 35 SE NE SE	24840	-247	-262	-554	-1144	-1614	-2050	-2843	-3212	-3471	
	SEC. 3 NW NW SW	21807	-330	-347	-651	-1352	-1938	-2255	-3005	-----	-----	
	SEC. 3 SE NW SW	21808	-329	-346	-653	-1340	-2010	-2255	-3004	-----	-----	
	SEC. 3 NW SW SE	21912	-319	-337	-641	-1336	-1934	-2230	-2977	-----	-----	
	SEC. 3 NW SW NW	21947	-343	-362	-668	-1385	-1968	-2281	-3033	-----	-----	
	SEC. 3 NW NW NW	22014	-364	-382	-683	-1431	-1940	-2273	-3027	-----	-----	

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 3 SE SW SE	22052	-310	-328	-629	-1303	-1972	-2224	-2978	-----	-----
SEC. 3 SE NE SW	22067	-376	-393	-687	-1377	-2037	-2277	-2983	-----	-----
SEC. 3 NW NE SW	22068	-----	-----	-695	-1358	-1954	-2251	-3010	-----	-----
SEC. 3 SE SE SW	22079	-307	-324	-628	-1317	-1906	-2242	-2996	-----	-----
SEC. 3 SE SW SW	22138	-297	-316	-620	-1288	-1980	-2229	-2979	-----	-----
SEC. 3 SE SW NW	22140	-340	-358	-666	-1368	-1922	-2266	-3022	-----	-----
SEC. 3 NW SE SW	22148	-317	-335	-642	-1341	-----	-2250	-3006	-----	-----
SEC. 3 NW SE NW	22151	-343	-361	-667	-1363	-1956	-2253	-3000	-----	-----
SEC. 3 SE SE NW	22210	-340	-358	-661	-1355	-1926	-2234	-2995	-----	-----
SEC. 3 SE NW NW	22803	-348	-366	-699	-1375	-1935	-2257	-3012	-----	-----
SEC. 3 NW SW SW	22938	-----	-----	-639	-1314	-1990	-2227	-2990	-----	-----
SEC. 4 SE SE NE	21576	-323	-341	-644	-1353	-1953	-2259	-3009	-----	-----
SEC. 4 SE SW SE	21634	-298	-315	-641	-1238	-----	-2210	-2967	-3338	-----
SEC. 4 SE NE SE	21702	-322	-338	-641	-1323	-1886	-2228	-2983	-3354	-----
SEC. 4 SE NW NE	21998	-----	-----	-668	-1341	-1973	-2262	-3030	-----	-----
SEC. 4 SE NE NE	22037	-344	-361	-667	-1391	-1964	-2288	-3041	-----	-----
SEC. 4 NW NE NE	22294	-350	-367	-673	-1405	-1990	-2285	-3049	-----	-----
SEC. 4 NW NE SE	22659	-325	-343	-645	-1333	-1894	-2231	-2989	-----	-----

LOCATION		STATE PERMIT										BB	TL	SL	NG	CL	TR	BR	GW
SEC. 4	SE SW NE	22873	-328	-345	-646	-1343	-1926	-2229	-2986	-3357	-3605								
SEC. 4	SE SE SE	23283	-----	-----	-612	-1258	-1953	-2219	-2973	-3343	-----								
SEC. 4	NE SW NE	24232	-334	-351	-653	-1351	-1898	-2242	-2991	-3364	-3611								
SEC. 9	SE SE SE	22792	-289	-306	-601	-1223	-1721	-2157	-2912	-3282	-----								
SEC. 9	SE NE NE	24451	-304	-322	-619	-1246	-1754	-2201	-2959	-3330	-----								
SEC. 10	NW SE SE	21395	-270	-286	-584	-1209	-1699	-2181	-2924	-----	-----								
SEC. 10	NW SW SE	21502	-280	-296	-594	-1234	-1755	-2195	-2939	-3299	-----								
SEC. 10	C W $\frac{1}{2}$ NW SW	21564	-282	-298	-595	-1245	-1800	-2180	-2916	-3285	-----								
SEC. 10	SE SE SW	21565	-268	-286	-580	-1218	-1749	-2179	-2943	-----	-----								
SEC. 10	NW SW NE	21593	-289	-306	-636	-1255	-1760	-2230	-2987	-----	-----								
SEC. 10	SE SW NE	21651	-283	-299	-628	-1236	-----	-2210	-2966	-3316	-----								
SEC. 10	NW SE SW	21675	-271	-289	-584	-1233	-1730	-2171	-2927	-----	-----								
SEC. 10	NW NW NE	21681	-----	-----	-----	-----	-----	-2199	-2959	-----	-----								
SEC. 10	SE NW NE	21733	-----	-----	-----	-----	-----	-2208	-2968	-----	-----								
SEC. 10	SE SW SE	21742	-267	-284	-577	-1202	-1751	-2182	-2932	-3286	-----								
SEC. 10	NW NE NE	21783	-303	-320	-621	-1280	-1785	-2205	-2965	-3334	-----								
SEC. 10	SE NW SW	21948	-286	-303	-604	-1257	-1741	-2166	-2920	-3287	-----								
SEC. 10	SE NE NW	21949	-283	-299	-598	-1247	-1831	-2235	-2978	-3328	-----								

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 10 NW SE NE	21994	-284	-300	-595	-1229	-1695	-2204	-2953	-----	-----
SEC. 10 SE NE SW	22015	-277	-294	-590	-1237	-1789	-2185	-2985	-3291	-----
SEC. 10 SE SE SE	22049	-270	-287	-583	-1211	-1704	-2169	-2922	-----	-----
SEC. 10 NW NW SE	22075	-277	-292	-601	-1248	-1720	-2188	-2939	-3291	-----
SEC. 10 NW NE NW	22083	-282	-299	-597	-1273	-----	-2237	-2993	-----	-----
SEC. 10 SE SE NW	22209	-----	-----	-603	-1257	-1804	-2206	-2959	-----	-----
SEC. 10 NW SE NW	22234	-289	-307	-608	-1269	-1761	-2223	-2966	-----	-----
SEC. 10 SE SW SW	22258	-283	-301	-596	-1231	-1720	-2175	-2924	-----	-----
SEC. 10 NW SW SW	22259	-290	-307	-610	-1242	-1731	-2165	-2925	-----	-----
SEC. 10 NW NE SE	22289	-276	-294	-590	-1211	-1686	-2199	-2956	-----	-----
SEC. 10 SE NW SE	22460	-----	-----	-587	-1222	-1783	-2192	-2946	-----	-----
SEC. 10 SE NE SE	22496	-273	-291	-587	-1212	-1737	-2181	-2946	-----	-----
SEC. 10 SE NW NW	22512	-284	-301	-601	-1249	-2231	-2979	-----	-----	-----
SEC. 10 SE SE NE	22561	-269	-288	-585	-1204	-1680	-2189	-2948	-----	-----
SEC. 10 SE NE NE	22562	-294	-312	-608	-1256	-1761	-2192	-2960	-----	-----
SEC. 10 NW NE SW	22641	-291	-308	-607	-1266	-1800	-2190	-2956	-----	-----
SEC. 10 SE SW NW	23719	-----	-----	-602	-1252	-1758	-2182	-2936	-----	-----
SEC. 10 NW NW NW	24125	-291	-309	-604	-1251	-1754	-2224	-2988	-----	-----

LOCATION	STATE	PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 10 NW SW NW	24236	-299	-316	-614	-1270	-1781	-2191	-2946	-3316	-3561	
SEC. 11 NW SW SE	21826	-305	-321	-622	-1245	-1741	-2175	-2941	-3313	-----	
SEC. 11 NW NW SW	22610	-278	-293	-591	-1208	-1695	-2192	-2946	-----	-----	
SEC. 11 NW SW SW	23144	-275	-295	-594	-1214	-1705	-2176	-2929	-3297	-----	
SEC. 11 SE SW SW	23547	-288	-306	-656	-1249	-1719	-2165	-2922	-3293	-----	
SEC. 12 NW SE NE	21739	-324	-343	-644	-1292	-1789	-2213	-2976	-3348	-----	
SEC. 14 NW SW NW	22144	-264	-282	-576	-1193	-1675	-2101	-2907	-----	-----	
SEC. 14 NW NW SW	22214	-259	-277	-570	-1194	-1713	-2156	-2905	-----	-----	
SEC. 14 NW NW NW	22401	-276	-293	-588	-1206	-1694	-2163	-2920	-----	-----	
SEC. 14 NW SW SW	22422	-----	-----	-589	-1235	-1693	-2166	-2907	-----	-----	
SEC. 14 SE NW NW	22485	-280	-298	-593	-1210	-1697	-2157	-2912	-----	-----	
SEC. 14 SE SW SW	22996	-280	-296	-589	-1231	-1744	-2140	-2892	-----	-----	
SEC. 14 NW NE NW	23339	-293	-311	-609	-1239	-1741	-2163	-2920	-----	-----	
SEC. 15 NE SE NE	09261	-----	-----	-----	-1180	-1657	-2169	-2888	-----	-----	
SEC. 15 NW SE NE	21394	-261	-280	-572	-1203	-1706	-2177	-2926	-----	-----	
SEC. 15 SE SE NW	21591	-----	-----	-587	-1275	-1745	-2158	-2902	-3275	-----	
SEC. 15 SE NW NE	21649	-266	-285	-577	-1243	-1796	-2180	-2937	-----	-----	
SEC. 15 SE NW SE	22040	-280	-298	-590	-1268	-1731	-2170	-2922	-----	-----	

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 15 SE SE NE	22050	-257	-275	-568	-1197	-1705	-2162	-2917	-----	-----
SEC. 15 NW SE SE	22163	-287	-304	-600	-1286	-1762	-2174	-2926	-----	-----
SEC. 15 SE NE NE	22176	-260	-278	-570	-1205	-1685	-2166	-2927	-----	-----
SEC. 15 NW NW SE	22177	-283	-301	-593	-1267	-1771	-2176	-2929	-----	-----
SEC. 15 SE SE SE	22208	-282	-299	-592	-1283	-1740	-2163	-2921	-----	-----
SEC. 15 NW NE SE	22222	-275	-292	-588	-1245	-----	-2174	-2922	-3280	-----
SEC. 15 NW NE NW	22260	-277	-296	-589	-1230	-1723	-2164	-2916	-----	-----
SEC. 15 SE SW NE	22387	-274	-291	-586	-1245	-1730	-2173	-2930	-----	-----
SEC. 15 SE NE SW	22390	-----	-----	-598	-1296	-1762	-2156	-2896	-----	-----
SEC. 15 SE NE SE	22455	-----	-----	-584	-1241	-1693	-2173	-2914	-----	-----
SEC. 15 NW SW NE	22523	-----	-----	-587	-1243	-1726	-2178	-2929	-----	-----
SEC. 15 SE NE NW	22601	-271	-294	-588	-1241	-1728	-2176	-2915	-----	-----
SEC. 15 SE NW NW	22802	-285	-301	-597	-1267	-1745	-2149	-2914	-----	-----
SEC. 15 NW SE NW	22951	-279	-297	-589	-1240	-1734	-2154	-2905	-----	-----
SEC. 15 SE SW SE	23017	-284	-302	-595	-1289	-1757	-2171	-2904	-3263	-----
SEC. 15 NW NW NW	23219	-282	-299	-593	-1223	-1725	-2151	-2906	-----	-----
SEC. 15 NW SW SE	23710	-----	-----	-591	-1279	-1730	-2165	-2900	-----	-----
SEC. 15 SE SE SW	23830	-287	-304	-596	-1284	-1759	-2145	-2902	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 15 NW SE SW	24012	-297	-313	-603	-1283	-1761	-2140	-2896	-3263	-----
SEC. 16 NW NW NE	21503	-303	-319	-617	-1231	-----	-2158	-2911	-3279	-----
SEC. 16 SE NE NE	22882	-----	-----	-604	-1236	-1738	-2146	-2906	-3277	-3522
SEC. 22 SE SE NE	21384	-283	-299	-592	-1281	-1753	-2141	-2898	-3249	-----
SEC. 22 SE NE SE	21417	-----	-----	-580	-1275	-1758	-2122	-2882	-3209	-----
SEC. 22 SE NE NE	21533	-284	-300	-595	-1278	-1749	-2171	-2916	-----	-----
SEC. 22 NW NE NE	22445	-280	-297	-590	-1287	-1764	-2167	-2918	-----	-----
SEC. 22 SE SE SE	22657	-259	-276	-563	-1260	-1738	-2099	-2851	-3222	-3468
SEC. 22 SE SE NW	22868	-269	-286	-575	-1277	-1738	-2097	-2854	-3225	-----
SEC. 22 NW SE NE	23098	-----	-----	-600	-1291	-1779	-2147	-2900	-----	-----
SEC. 22 NW SE SE	23202	-----	-275	-564	-1248	-1739	-2100	-2849	-3217	-----
SEC. 22 SE SW NE	23275	-281	-297	-586	-1268	-1759	-2119	-2871	-----	-----
SEC. 22 NW NW NE	23368	-----	-----	-595	-1285	-1757	-2156	-2893	-----	-----
SEC. 22 SE NW NE	23472	-----	-299	-593	-1275	-1751	-2152	-2884	-----	-----
SEC. 22 NW NE SE	23587	-276	-294	-584	-1272	-1759	-2123	-2870	-----	-----
SEC. 22 NE SW NE	23865	-282	-299	-590	-1284	-1755	-2125	-2886	-3244	-----
SEC. 22 NW SW NE	24110	-286	-304	-594	-1282	-1758	-2124	-2877	-3246	-----
SEC. 23 NW NW SW	21195	-----	-----	-----	-----	-----	-----	-2898	-3248	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 23 NW SW SW	21333	-276	-292	-584	-1280	-----	-2119	-2871	-----	-----
SEC. 23 SE SW SW	21334	-265	-282	-573	-1274	-1751	-2124	-2880	-----	-----
SEC. 23 SE NW SW	21385	-271	-287	-581	-1286	-1750	-2149	-2887	-----	-----
SEC. 23 SE SW NW	21415	-274	-292	-583	-1262	-1724	-2146	-2891	-----	-----
SEC. 23 NW SE SW	21416	-262	-281	-571	-1280	-1753	-2123	-2881	-----	-----
SEC. 23 SE NW NW	21532	-279	-297	-586	-1249	-1710	-2144	-2897	-----	-----
SEC. 23 NW SE NW	21648	-274	-291	-581	-1222	-1694	-2130	-2884	-3258	-----
SEC. 23 NW NE SW	21696	-272	-288	-578	-1249	-1723	-2134	-2888	-----	-----
SEC. 23 NW NW NW	21715	-276	-295	-586	-1257	-1719	-2105	-2914	-----	-----
SEC. 23 NW SW SE	22109	-258	-277	-565	-1250	-1694	-2103	-2859	-3231	-----
SEC. 23 SE SE NW	22235	-269	-286	-573	-1219	-----	-2124	-2877	-3247	-----
SEC. 23 SE NE SW	22658	-269	-286	-574	-1242	-1706	-2116	-2864	-3235	-3482
SEC. 23 NW NW SW	23143	-273	-290	-583	-1288	-1784	-2146	-2899	-3251	-----
SEC. 26 NW NW NE	21934	-255	-272	-564	-1245	-1716	-2108	-2854	-3224	-----
SEC. 26 SE NW NW	22624	-239	-256	-544	-1206	-----	-2118	-2863	-3229	-----
SEC. 26 NW NE NW	22629	-243	-259	-545	-1195	-----	-2122	-2869	-3228	-----
SEC. 26 SE NE NW	22968	-235	-251	-544	-1232	-1700	-2106	-2852	-3214	-----
SEC. 26 NW SE NW	22997	-238	-256	-546	-1256	-1723	-2110	-2869	-3226	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 26 SE SE NW	23039	-230	-248	-541	-1248	-1733	-2098	-2853	-3209	-----
SEC. 26 SE NE SW	23152	-221	-238	-531	-1220	-1714	-2098	-2858	-3206	-----
SEC. 26 NW NW SE	23267	-225	-242	-534	-1220	-1695	-2080	-2852	-3206	-----
SEC. 26 NW SW SE	23296	-205	-221	-509	-1174	-1658	-2081	-2844	-3189	-----
SEC. 26 SE NW SE	23324	-209	-226	-512	-1158	-----	-----	-2834	-3195	-----
SEC. 26 SE SW SE	23353	-213	-230	-520	-1231	-1656	-2065	-2831	-3180	-----
SEC. 26 SE SE SW	23537	-205	-222	-512	-1211	-1711	-2067	-2824	-3176	-----
SEC. 26 NW NE SW	23552	-219	-236	-529	-1238	-1722	-2098	-2853	-3207	-----
SEC. 26 NW SE SE	23576	-----	-----	-516	-1183	-1652	-2079	-2822	-3192	-3443
SEC. 26 NW NW NW	23586	-255	-273	-563	-1264	-1734	-2107	-2854	-3223	-3469
SEC. 26 NW SE SW	23602	-218	-234	-525	-1243	-1709	-2081	-2842	-3195	-----
SEC. 26 SE SW NW	23604	-242	-260	-553	-1270	-1749	-2109	-2872	-----	-----
SEC. 26 SE NW SW	23725	-227	-244	-536	-1230	-1724	-2081	-2840	-3199	-----
SEC. 26 NW SW NW	23741	-246	-263	-554	-1248	-1735	-2112	-2869	-----	-----
SEC. 26 NW SW NE	24572	-----	-----	-556	-1252	-1740	-2102	-2866	-----	-----
SEC. 26 NW NW SW	24906	-240	-257	-548	-1236	-1727	-2089	-2842	-3199	-----
SEC. 27 NW NW SW	21470	-248	-265	-553	-1199	-1649	-2054	-2810	-3174	-----
SEC. 27 SE NE NE	23950	-248	-265	-553	-1251	-1721	-2104	-2861	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 27 NW NE NE	24291	-260	-277	-567	-1249	-1737	-2097	-2851	-3217	-----
SEC. 35 SE SW SW	21513	-208	-224	-502	-1154	-1624	-2002	-2766	-3132	-----
SEC. 35 NW NW NE	22219	-----	-----	-523	-1228	-1752	-2069	-2826	-3176	-----
SEC. 35 SE SE NE	23171	-210	-227	-511	-1210	-1676	-2053	-2811	-3162	-----
SEC. 35 SE SW NE	23247	-200	-217	-500	-1199	-1678	-2052	-2806	-3152	-----
SEC. 35 NW SE NE	23248	-203	-220	-506	-1209	-1696	-2059	-2806	-3163	-----
SEC. 35 SE NE SE	23300	-212	-229	-514	-1214	-1692	-2080	-2828	-3179	-----
SEC. 35 NW NE SE	23354	-207	-223	-508	-1210	-1687	-2060	-2820	-3169	-----
SEC. 35 NW NE NE	23473	-----	-----	-524	-1221	-1717	-2058	-2818	-3171	-----
SEC. 35 SE NW NE	23474	-----	-----	-513	-1229	-1668	-2059	-2817	-3173	-----
SEC. 35 NW SW NE	23504	-204	-221	-508	-1205	-1691	-2050	-2817	-3166	-----
SEC. 35 SE NE NW	23562	-217	-235	-523	-1214	-1707	-2055	-2819	-3167	-----
SEC. 35 SE NW SE	23631	-208	-225	-506	-1188	-1667	-2032	-2785	-3153	-----
SEC. 35 NW NE NW	23682	-219	-236	-523	-1217	-1687	-2051	-2806	-3172	-----
SEC. 35 SE SE SE	23949	-207	-224	-509	-1207	-1696	-2046	-2817	-3173	-----
SEC. 36 SE SW SE	21585	-219	-236	-515	-1190	-1696	-2012	-2791	-3158	-----
SEC. 36 SE SE SW	22456	-----	-----	-509	-1200	-1682	-2039	-2791	-3159	-----
SEC. 36 NW SW SE	22606	-213	-230	-510	-1185	-1665	-2019	-2793	-3164	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 36 SE SW SW	22756	-181	-199	-482	-1233	-1686	-2047	-2794	-3145	-----
SEC. 36 NW SW SW	22846	-210	-226	-510	-1212	-1697	-2057	-2818	-3172	-----
SEC. 36 SE NW SW	22967	-213	-229	-513	-1214	-1689	-2050	-2817	-3163	-----
SEC. 36 SE NE SW	23103	-205	-223	-505	-1181	-1667	-2029	-2789	-3107	-3407
SEC. 36 NW SW NW	23560	-----	-----	-517	-1200	-1670	-2060	-2810	-3170	-----
SEC. 36 NW NW SW	23942	-214	-230	-514	-1214	-1693	-2066	-2816	-3164	-----
SEC. 36 NW NE SW	24655	-214	-231	-513	-1188	-1683	-2030	-2797	-3164	-----
SEC. 6 SE NW NW	21883	-214	-230	-510	-1174	-1676	-2000	-2781	-3146	-3398
SEC. 6 SE SE NW	22484	-209	-224	-503	-1153	-1625	-1981	-2764	-3129	-3384
SEC. 6 SE SW SW	22574	-----	-----	-485	-1153	-1572	-1997	-2779	-----	-----
SEC. 6 NW SW SW	22604	-189	-205	-483	-1103	-1583	-2017	-2792	-----	-----
SEC. 6 SE SE SW	22908	-183	-199	-481	-1234	-1623	-1977	-2746	-3109	-3362
SEC. 6 SE NW SW	23115	-196	-211	-495	-1148	-1615	-1986	-2765	-3129	-3381
SEC. 6 NW NW SW	23661	-----	-----	-494	-1157	-1631	-1996	-2769	-3134	-----
SEC. 6 SW NW SW	23789	-----	-----	-490	-1159	-1570	-1960	-2774	-3134	-----
SEC. 7 SE SW NE	19913	-186	-202	-486	-1120	-1616	-1984	-2763	-3113	-----
SEC. 7 SE NE SE	19931	-183	-200	-481	-1063	-1550	-1948	-2720	-----	-----
SEC. 7 SE SW SE	21419	-170	-186	-469	-1080	-1573	-1954	-2730	-3082	-----

T4S R3W

LOCATION		STATE PERMIT		SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC.	7 SE NE SW	21454	-173	-190	-469	-1107	-1603	-1970	-2739	-----	-----	-----
SEC.	7 SE SE SE	21523	-179	-192	-477	-1062	-1561	-1947	-2733	-3076	-----	-----
SEC.	7 SE NW SE	21752	-180	-195	-480	-1083	-1573	-1983	-2750	-3101	-----	-----
SEC.	7 NW SE SE	22035	-179	-195	-476	-1075	-1560	-1961	-2739	-3085	-----	-----
SEC.	7 SE SW NW	22213	-179	-196	-478	-1134	-1623	-1990	-2756	-3094	-----	-----
SEC.	7 SE SE NW	22218	-180	-197	-483	-1134	-1629	-1992	-2746	-3106	-----	-----
SEC.	7 SE SE SW	22360	-177	-193	-470	-1076	-1561	-1946	-2720	-3082	-----	-----
SEC.	7 NW SW SE	22361	-177	-192	-477	-1091	-1587	-1968	-2737	-3090	-----	-----
SEC.	7 NW NW SE	22362	-180	-196	-483	-1126	-1613	-1976	-2744	-3096	-----	-----
SEC.	7 SE NE NW	22411	-170	-188	-473	-1130	-1601	-1938	-2754	-3112	-----	-----
SEC.	7 NW SE SW	22461	-177	-194	-471	-1097	-1582	-1957	-2741	-3087	-----	-----
SEC.	7 NW SE NW	22495	-181	-198	-483	-1150	-1625	-1997	-2754	-3110	-----	-----
SEC.	7 NW NE NW	22506	-167	-183	-470	-1132	-1594	-1981	-2755	-3102	-----	-----
SEC.	7 NW SW NE	22520	-187	-203	-490	-1130	-1608	-1988	-2757	-3099	-----	-----
SEC.	7 NW SW NW	22582	-179	-195	-478	-1139	-1607	-1986	-2750	-3083	-----	-----
SEC.	7 SE NW NW	22583	-173	-188	-475	-1143	-1614	-1993	-2756	-3112	-----	-----
SEC.	7 NW NW NW	22626	-188	-205	-490	-1161	-1616	-2007	-2781	-3137	-----	-----
SEC.	7 SE NW SW	22634	-175	-190	-468	-1110	-1579	-1956	-2727	-3089	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 7 NW NW NE	24286	-184	-200	-486	-1119	-1597	-1975	-2747	-3106	-----
SEC. 8 SE NW SW	22731	-189	-205	-488	-1065	-1555	-1939	-2726	-3089	-3340
SEC. 9 NE NE SE	21226	-203	-222	-499	-1112	-1579	-1966	-2754	-3117	-----
SEC. 15 SE SW SE	22649	-----	-----	-446	-992	-----	-1909	-2708	-3071	-3329
SEC. 16 NW SW SE	21973	-----	-----	-462	-1012	-1498	-1903	-2691	-3054	-3309
SEC. 16 NW SE NW	22340	-----	-----	-470	-1047	-----	-1928	-2710	-3071	-3325
SEC. 16 NW NW SW	24548	-167	-184	-460	-1018	-1553	-1911	-2694	-3055	-----
SEC. 16 SE NW SW	24925	-----	-----	-473	-1033	-1541	-1902	-2688	-3051	-----
SEC. 17 SE NW NW	21420	-169	-186	-473	-1056	-----	-1923	-2708	-3064	-----
SEC. 17 NW NW NW	21713	-178	-194	-480	-1072	-1575	-1936	-2726	-3089	-----
SEC. 17 NW SW NW	21828	-169	-181	-465	-1039	-1535	-1921	-2703	-3058	-----
SEC. 17 NW NE SE	21906	-----	-----	-----	-----	-----	-----	-2692	-3055	-----
SEC. 17 NW NW SW	21920	-----	-----	-452	-1029	-1511	-1898	-2679	-3042	-3298
SEC. 17 SE SW NW	21939	-----	-----	-467	-1037	-1535	-1916	-2702	-3056	-----
SEC. 17 SE NE SE	21960	-226	-236	-470	-1024	-1519	-1909	-2685	-3046	-3299
SEC. 17 NW NE SW	22103	-169	-185	-465	-1038	-1520	-1912	-2698	-3048	-3304
SEC. 17 SE SW NE	22150	-183	-199	-480	-1050	-1538	-1922	-2700	-3062	-----
SEC. 17 NW SE NW	22232	-174	-190	-475	-1044	-1541	-1913	-2695	-3059	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 17 SE NE SW	22267	-170	-183	-457	-1023	-1525	-1898	-2679	-3041	-3302
SEC. 17 SE NW SE	22934	-171	-185	-462	-1016	-1493	-1901	-2684	-3046	-----
SEC. 17 NW NW SE	23501	-174	-189	-467	-1034	-1536	-1911	-2706	-3053	-----
SEC. 17 SE NE NW	23520	-180	-195	-478	-1051	-1541	-1923	-2705	-3069	-3326
SEC. 17 SE SE NW	24472	-----	-----	-463	-1037	-1540	-1904	-2688	-3049	-----
SEC. 18 SE SW NE	21677	-159	-173	-445	-1031	-1515	-1910	-2691	-3050	-----
SEC. 18 SE NE NE	21697	-167	-182	-466	-1059	-1529	-1930	-2705	-3060	-----
SEC. 18 SE SE NE	21784	-155	-167	-445	-1030	-1518	-1919	-2695	-3047	-----
SEC. 18 NW NE NE	21887	-173	-188	-472	-1061	-1548	-1949	-2721	-3076	-----
SEC. 18 NW SE NE	22051	-161	-177	-450	-1035	-1529	-1916	-2693	-3054	-----
SEC. 18 NW NE SE	22171	-154	-165	-446	-1020	-1502	-1902	-2686	-3048	-----
SEC. 18 SE NW NE	22179	-----	-----	-460	-1060	-1567	-1928	-2723	-3063	-----
SEC. 18 NW SW NE	22344	-156	-171	-448	-1026	-1517	-1912	-2692	-3055	-----
SEC. 18 NW NW NE	22504	-----	-----	-480	-1067	-1566	-1951	-2717	-3081	-----
SEC. 18 SE NE NW	22598	-171	-184	-460	-1053	-1541	-1927	-2703	-3068	-----
SEC. 18 SE SE NW	22705	-163	-178	-451	-1032	-1521	-1910	-2691	-3051	-----
SEC. 18 SW NW NE	23828	-170	-186	-460	-1056	-1545	-1926	-2702	-3065	-3314
SEC. 18 SE SE SE	24287	-156	-171	-446	-1007	-1485	-1898	-2673	-----	-----

LOCATION		STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 18	NW NW SE	24683	-159	-173	-450	-1020	-1513	-1899	-2682	-3043	-3296
SEC. 18	SE NW SE	29942	-160	-176	-447	-1019	-1498	-1902	-2685	-3048	-----
SEC. 19	SE NE NE	22082	-163	-178	-456	-1014	-----	-1896	-2685	-----	-----
SEC. 19	SE SW SE	22159	-154	-169	-439	--971	-1434	-1832	-2622	-2980	-3225
SEC. 19	NW NE NE	22247	-161	-175	-447	-1014	-1490	-1888	-2669	-3032	-3294
SEC. 19	SE SE NE	23022	-156	-171	-441	-1010	-1493	-1877	-2656	-3012	-3265
SEC. 20	SE NW SW	21273	-139	-157	-426	--967	-----	-1847	-2662	-----	-----
SEC. 20	SE SE SW	21376	-116	-129	-399	--929	-1427	-1866	-2645	-3001	-----
SEC. 20	NW NE SW	21389	-137	-152	-423	--990	-1490	-1890	-2673	-----	-----
SEC. 20	NW SE SW	21418	-131	-145	-419	--945	-1396	-1861	-2648	-3005	-----
SEC. 20	NW NW SW	21439	-----	-----	-----	-----	-----	-1875	-2650	-3010	-3263
SEC. 20	SE SW NW	21461	-156	-171	-447	-1014	-1501	-1904	-2686	-----	-----
SEC. 20	SE NW NW	21815	-----	-----	-----	-----	-----	-----	-2677	-3034	-----
SEC. 20	NW SW SW	22437	-131	-144	-413	--942	-1392	-1858	-2644	-3004	-3252
SEC. 20	NW NW SE	22469	-135	-149	-419	--969	-1448	-1888	-2657	-----	-----
SEC. 20	SE SE SE	22571	-130	-143	-413	--944	-1401	-1868	-2656	-----	-----
SEC. 20	NW NE SE	22652	-133	-146	-420	--942	-1404	-1865	-2651	-3011	-3262
SEC. 20	SE NE SW	22662	-135	-148	-417	--971	-1418	-1891	-2669	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 20 SE NW SE	22688	-124	-138	-406	-948	-1443	-1893	-2653	-----	-----
SEC. 20 NW SE SE	22733	-126	-141	-410	-948	-1403	-1877	-2655	-----	-----
SEC. 20 NW NW NW	22739	-162	-176	-455	-1025	-1530	-1899	-2676	-----	-----
SEC. 20 NW SW SE	22753	-120	-133	-400	-938	-1402	-1884	-2663	-----	-----
SEC. 20 SE SW SE	22914	-124	-137	-407	-943	-1379	-1875	-2660	-----	-----
SEC. 20 NW SW NE	23095	-148	-162	-434	-987	-1465	-1874	-2664	-3024	-3269
SEC. 20 SW NE SE	23477	-121	-137	-405	-940	-1391	-1864	-2684	-----	-----
SEC. 20 NW NW NE	23523	-165	-179	-458	-1016	-1508	-1886	-2670	-3032	-----
SEC. 20 SE NE NW	23591	-155	-170	-441	-1006	-1497	-1880	-2664	-----	-----
SEC. 20 SE NE SE	23607	-128	-142	-411	-925	-----	-1872	-2650	-----	-----
SEC. 21 SE SE SE	23230	-----	-----	-414	-916	-1341	-1871	-2656	-3016	-3271
SEC. 21 SW SW SW	25073	-125	-138	-409	-928	-1387	-1864	-2654	-----	-----
SEC. 24 SE SE SW	23344	-124	-139	-415	-952	-1392	-1874	-2677	-3037	-3296
SEC. 28 SE SE NE	21985	-120	-135	-407	-917	-1359	-1851	-2630	-2990	-3239
SEC. 28 SE SW SW	22265	-96	-108	-377	-913	-1349	-1845	-2636	-----	-----
SEC. 28 NW SW SW	22416	-106	-121	-390	-926	-1364	-1849	-2638	-----	-----
SEC. 28 NW NW SW	22480	-106	-119	-393	-927	-1376	-1848	-2635	-----	-----
SEC. 28 NW NW NW	22491	-111	-124	-391	-910	-1356	-1863	-2644	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 28 SE NW SW	22513	-102	-115	-389	-911	-1360	-1851	-2631	-----	-----
SEC. 28 SE NW NW	22546	-114	-123	-394	-911	-1334	-1852	-2642	-2993	-3243
SEC. 28 NW SE SW	22585	-110	-126	-395	-925	-1353	-1855	-2644	-----	-----
SEC. 28 SE SE SW	22617	-103	-117	-386	-920	-1352	-1855	-2648	-----	-----
SEC. 28 NW SW NW	22686	-107	-122	-390	-909	-1348	-1855	-2643	-----	-----
SEC. 28 SE SW NW	22841	-111	-123	-394	-925	-1359	-1841	-2631	-----	-----
SEC. 28 SE SW SE	22921	-100	-112	-385	-918	-1331	-1824	-2614	-----	-----
SEC. 28 NW SW SE	23284	-----	-----	-394	-916	-1335	-1832	-2623	-----	-----
SEC. 28 NW NE SW	23571	-115	-128	-403	-923	-1366	-1841	-2636	-----	-----
SEC. 28 SW SW SE	23953	-98	-111	-383	-932	-1377	-1830	-2614	-2974	-----
SEC. 28 NW NE SE	24031	-113	-125	-399	-896	-1339	-1832	-2626	-2984	-3235
SEC. 28 NW SE NW	24364	-----	-----	-----	-----	-----	-----	-2629	-2991	-----
SEC. 28 SW SE NW	24835	-----	-----	-----	-----	-----	-----	-2646	-----	-----
SEC. 29 SE SE SE	22388	-104	-120	-391	-912	-1364	-1835	-2637	-----	-----
SEC. 29 NW SE SE	22463	-115	-130	-401	-921	-1370	-1824	-2611	-2968	-3218
SEC. 29 SE NE SE	22521	-104	-118	-387	-917	-1335	-1844	-2634	-----	-----
SEC. 29 SE SE NE	22542	-102	-116	-387	-916	-1352	-1849	-2631	-----	-----
SEC. 29 SE NE NE	22570	-109	-123	-391	-871	-1338	-1874	-2643	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 29 NW NE SE	22799	-103	-116	-386	-916	-1338	-1839	-2624	-----	-----
SEC. 29 NW SE NE	23076	-97	-109	-376	-904	-1337	-1860	-2630	-----	-----
SEC. 29 SE NW NE	23883	-100	-114	-380	-907	-1345	-1852	-2628	-----	-----
SEC. 32 SE NE NE	20920	-97	-110	-376	-885	-1314	-1804	-2595	-2950	-3192
SEC. 32 NE NE NE	23145	-98	-112	-381	-901	-1336	-1815	-2599	-2956	-3208
SEC. 32 SE SE NE	23935	-----	-----	-383	-890	-1303	-1807	-2593	-2949	-----
SEC. 33 SE NE SW	22141	-78	-90	-360	-887	-1315	-1815	-2613	-----	-----
SEC. 33 SE NW NW	22227	-84	-97	-366	-887	-1331	-1825	-2630	-----	-----
SEC. 33 NW NE SW	22241	-91	-106	-378	-900	-1330	-1815	-2608	-----	-----
SEC. 33 NW NW NW	22256	-91	-106	-373	-903	-1351	-1832	-2622	-----	-----
SEC. 33 SE SW NW	22263	-81	-96	-369	-879	-1303	-1810	-2594	-----	-----
SEC. 33 NW SW SE	22363	-----	-----	-----	-----	-----	-----	-2598	-----	-----
SEC. 33 NW SE NW	22391	-----	-----	-380	-917	-1333	-1836	-2627	-----	-----
SEC. 33 NW NW SE	22464	-----	-----	-363	-900	-1326	-1826	-2608	-----	-----
SEC. 33 SE SE SE	22503	-----	-----	-352	-911	-1350	-1812	-2589	-----	-----
SEC. 33 NW NE NW	22508	-----	-----	-379	-918	-1407	-1839	-2630	-----	-----
SEC. 33 SE NW SE	22563	-----	-----	-357	-895	-1310	-1831	-2614	-----	-----
SEC. 33 SE NE NW	22564	-86	-100	-374	-914	-1364	-1836	-2624	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 33 NW SE NE	22600	-----	-----	-380	-917	-1327	-1844	-2630	-----	-----
SEC. 33 SE SW SE	22605	-67	-82	-354	-897	-1344	-1794	-2581	-----	-----
SEC. 33 SE SE NW	22630	-90	-102	-377	-919	-1361	-1827	-2615	-----	-----
SEC. 33 NW SE SE	22654	-65	-79	-353	-902	-1333	-1826	-2596	-----	-----
SEC. 33 SE SW NE	22660	-----	-----	-330	-917	-1367	-1828	-2621	-----	-----
SEC. 33 SE SE SW	22663	-----	-----	-359	-877	-----	-1798	-2581	-----	-----
SEC. 33 NW NE SE	22696	-----	-----	-365	-910	-1337	-1828	-2615	-----	-----
SEC. 33 SE NE SE	22725	-64	-78	-350	-896	-1324	-1815	-2602	-----	-----
SEC. 33 SE NW SW	22740	-82	-96	-365	-867	-1316	-1798	-2583	-2933	-3182
SEC. 33 NW NW NE	22761	-100	-113	-386	-925	-1370	-1841	-2625	-----	-----
SEC. 33 SE NW NE	22787	-92	-104	-376	-920	-1329	-1838	-2625	-----	-----
SEC. 33 NW SE NE	22811	-89	-101	-374	-904	-1351	-1833	-2617	-----	-----
SEC. 33 SE SE NE	22812	-81	-93	-366	-906	-1369	-1817	-2605	-----	-----
SEC. 33 NW NW SW	22872	-94	-108	-376	-884	-1306	-1815	-2614	-----	-----
SEC. 33 NW SW NW	22952	-92	-106	-372	-887	-1338	-1807	-2601	-2962	-3217
SEC. 33 NW SE SW	22990	-77	-91	-357	-871	-1296	-1795	-2572	-----	-----
SEC. 33 SE NE NE	23338	-----	-----	-371	-893	-1298	-1821	-2611	-----	-----
SEC. 33 SE SW SW	23784	-77	-92	-360	-853	-1281	-1783	-2572	-2927	-3179

LOCATION	STATE	PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 33 NW NE NE	23831	-196	-209	-378	-1009	-1429	-1927	-2705	-3066	-3317	
SEC. 33 SW NE NE	24174	-89	-101	-372	-912	-1321	-1828	-2618			
SEC. 33 NE SW NW	24233	-86	-98	-367	-885	-1297	-1818	-2606	-2956	-3209	
SEC. 33 SW SW NW	24283	-92	-106	-376	-886	-1317	-1806	-2598	-2955	-3208	
SEC. 34 SE SW SW	22425			-358	-912	-1341	-1802	-2582			
SEC. 34 NW SW SW	22427	-72	-84	-360	-920	-1356	-1807	-2602			
SEC. 34 NW SE SW	22428	-76	-88	-360	-899	-1330	-1793	-2580			
SEC. 34 SE NW SW	22747	-72	-86	-356	-882	-1308	-1810	-2590			
SEC. 34 NW NW SW	22777			-354	-885	-1308	-1824	-2594			
SEC. 34 NW SW SE	22957	-79	-92	-361	-881	-1313	-1780	-2580	-2937	-3198	
SEC. 34 NW SW NW	23015	-86	-98	-370	-897	-1341	-1820	-2612	-2976		
SEC. 34 SE NE SW	23197			-359	-882	-1323	-1779	-2578	-2935	-3196	
SEC. 34 SE SW NW	23198	-86	-100	-371	-898	-1329	-1806	-2587			
SEC. 34 SE NW NW	24361	-93	-105	-375	-884	-1311	-1813	-2603	-2961		
SEC. 34 SW SW SE	24608			-358	-825	-1311	-1786	-2585			
SEC. 36 SE NE NW	22691	-103	-114	-388	-905	-1347	-1824	-2617	-2976	-3238	
SEC. 1 NW NW NE	22145	-201	-219	-499	-1180	-1668	-2016	-2786	-3132		
SEC. 1 SE NE NW	22400		-221	-512	-1213	-1655	-2039	-2808	-3162		

T4S R4W

LOCATION		STATE PERMIT				TL	SL	NG	CL	TR	BR	GW
SEC. 1	NW SW NE	22509	-----	-----	-501	-1203	-1679	-2033	-2807	-3163	-----	-----
SEC. 1	C NW NE	22543	-218	-234	-515	-1188	-1666	-2017	-2793	-3161	-3416	
SEC. 1	SE SW NE	22573	-199	-216	-496	-1206	-1671	-2029	-2797	-3149	-----	-----
SEC. 1	NW NE NW	22616	-209	-227	-509	-1213	-1678	-2046	-2820	-3174	-----	-----
SEC. 1	SE NE SE	22653	-192	-209	-489	-1181	-1659	-2021	-2789	-3138	-----	-----
SEC. 1	SE SE SE	22687	-192	-209	-500	-1175	-1658	-2023	-2802	-3160	-----	-----
SEC. 1	NW NE NW	22695	-210	-226	-509	-1215	-1694	-2054	-2814	-3166	-----	-----
SEC. 1	NW NE SE	22709	-199	-215	-495	-1191	-1660	-2024	-2795	-3149	-----	-----
SEC. 1	NW SE SE	22735	-199	-214	-499	-1209	-1672	-2034	-2807	-3159	-----	-----
SEC. 1	SE NW SE	22755	-200	-217	-500	-1204	-1680	-2028	-2809	-3165	-----	-----
SEC. 1	SE NW NE	22786	-----	-----	-509	-1193	-1668	-1968	-2800	-3150	-----	-----
SEC. 1	NW NW SE	22795	-----	-----	-496	-1185	-1668	-2025	-2803	-3154	-----	-----
SEC. 1	SE SW SE	22842	-197	-213	-502	-1177	-1650	-2010	-2781	-3122	-----	-----
SEC. 1	SE SE NW	22845	-----	-----	-497	-1200	-1770	-2024	-2798	-3155	-----	-----
SEC. 1	NW SW SE	22891	-204	-220	-507	-1189	-1655	-2011	-2779	-3133	-----	-----
SEC. 1	NW SE NW	22895	-----	-----	-499	-1203	-1662	-2017	-2792	-3151	-----	-----
SEC. 1	NW SE NE	22922	-206	-222	-503	-1197	-1652	-2013	-2789	-3150	-----	-----
SEC. 1	SE NW NW	22923	-201	-218	-497	-1197	-1678	-2017	-2778	-3147	-3398	

LOCATION		STATE PERMIT				TL	SL	NG	CL	TR	BR	GW
SEC. 1	NW NE NE	23027	-----	-----	-----	-504	-1174	-1653	-2010	-2782	-3148	-3401
SEC. 1	NW NE SW	23114	-----	-----	-----	-487	-1170	-1680	-1992	-2762	-3129	-3378
SEC. 1	SE SE NE	23280	-----	-----	-----	-498	-1172	-1650	-2006	-2779	-3146	-----
SEC. 1	SW NE NE	23559	-209	-224	-503	-503	-1177	-1651	-2008	-2781	-3147	-----
SEC. 1	SE NE SW	23608	-196	-211	-492	-492	-1164	-1635	-1995	-2762	-3126	-3377
SEC. 1	NW NW NW	25225	-194	-212	-494	-494	-1182	-1669	-2025	-2783	-3150	-----
SEC. 12	NW NE NE	22618	-188	-205	-493	-493	-1157	-1628	-1998	-2767	-3129	-----
SEC. 12	SE NE NE	22734	-179	-196	-484	-484	-1148	-1618	-1988	-2769	-----	-----
SEC. 12	SE NW NE	22946	-191	-206	-493	-493	-1136	-1596	-1974	-2745	-3107	-----
SEC. 12	SE SE NE	24409	-182	-198	-477	-477	-1122	-----	-1955	-2733	-3095	-----
SEC. 20	NW NE NE	24310	-172	-189	-463	-463	-995	-1505	-1838	-2610	-2968	-3204
SEC. 22	NW NE SE	23551	-163	-179	-452	-452	-985	-1487	-1840	-2615	-2975	-3223
T5S R2W SEC. 3	NW SE SW	21940	-105	-116	-394	-394	-935	-1319	-1803	-2604	-2965	-3230
SEC. 18	S $\frac{1}{2}$ W $\frac{1}{2}$	24719	-35	-48	-316	-316	-783	-1205	-1676	-2477	-2831	-3093
SEC. 19	NW SW NW	22499	-17	-29	-299	-299	-773	-1178	-1643	-2447	-2801	-3063
SEC. 19	SE SW SE	22528	-20	-33	-298	-298	-763	-1163	-1635	-2441	-2793	-3046
SEC. 19	N $\frac{1}{2}$ NW NW	24493	-23	-37	-308	-308	-771	-1194	-1662	-2466	-----	-----
SEC. 19	SE SE NW	24755	-41	-56	-328	-328	-785	-1213	-1664	-2483	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 19 NW SW NE	24854	-42	-54	-326	-803	-1216	-1668	-2477	-2834	-3095
SEC. 19 SE NW NE	24970	-52	-65	-336	-821	-1232	-1681	-2492	-2857	-----
SEC. 19 NW NW NE	24997	-45	-57	-329	-820	-1236	-1683	-2487	-2842	-----
SEC. 19 SW NW NE	25090	-52	-64	-335	-814	-1224	-1680	-2496	-----	-----
SEC. 19 NW NE NW	25146	-28	-42	-308	-787	-1195	-1668	-2469	-2822	-----
SEC. 20 NW NW SE	23371	-24	-38	-310	-803	-1174	-1656	-2463	-2818	-3080
SEC. 20 NW NW NE	24625	-46	-60	-332	-812	-1228	-1675	-2485	-2839	-----
SEC. 20 SE NW NW	24816	-45	-56	-328	-805	-1216	-1680	-2488	-2841	-----
SEC. 20 NW SW NE	24841	-33	-46	-316	-806	-1198	-1670	-2475	-2826	-3084
SEC. 30 C SW SW	23803	-----	-----	-254	-711	-1106	-1569	-2379	-2729	-2993
SEC. 30 NW NE SE	23882	-27	-38	-308	-764	-1185	-1618	-2441	-2797	-3059
SEC. 31 C S/3 W $\frac{1}{2}$ NW	21383	f29	f16	-249	-697	-1078	-1567	-2365	-2708	-----
SEC. 31 C W $\frac{1}{2}$ NW	22710	f22	f10	-255	-708	-1098	-1575	-2370	-2721	-----
SEC. 31 C N/3 W $\frac{1}{2}$ SW	22790	f43	f32	-232	-674	-1058	-1534	-2342	-2691	-----
SEC. 31 SW SW	22876	f47	f32	-230	-664	-1043	-1517	-2328	-2674	-2942
SEC. 31 NW NE SW	23282	f36	f23	-242	-686	-1080	-1546	-2354	-2702	-2964
SEC. 31 C W $\frac{1}{2}$ SW	23893	f42	f31	-235	-679	-1059	-1531	-2334	-2680	-----
SEC. 31 C N/3 W $\frac{1}{2}$ NW	24378	f28	f13	-252	-713	-1109	-1573	-2377	-2724	-----

LOCATION	STATE	PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 31 NW SE NW	24551	f42	f28	-235	-699	-1062	-1552	-2353	-2702	-2969	
SEC. 31 SE NE NW	24552	f24	f13	-252	-708	-1097	-1562	-2372	-2722	-----	
SEC. 31 C W ¹ / ₂ NW	24658	f25	f12	-253	-706	-1099	-1574	-2370	-2721	-2984	
SEC. 31 SE SE NE	24746	-11	-22	-289	-743	-1153	-1584	-2406	-2756	-----	
SEC. 31 SE SW NE	24787	f5	-9	-277	-728	-1128	-1575	-2388	-2736	-3000	
SEC. 31 SE NE SE	24930	-4	-17	-283	-733	-1111	-1593	-2406	-2748	-----	
SEC. 31 NW SW NE	24943	f17	f5	-261	-714	-1117	-1571	-2379	-2728	-----	
SEC. 31 NW NW NE	24944	f10	-3	-269	-721	-1019	-1585	-2389	-2739	-----	
SEC. 31 NW NW SE	24995	f17	f3	-261	-699	-1100	-1568	-2381	-2724	-----	
SEC. 31 SE NW SE	25075	f12	-2	-265	-721	-1098	-1576	-2390	-2747	-----	
SEC. 31 NW NE SE	25084	-12	-25	-292	-745	-1140	-1585	-2418	-2770	-----	
SEC. 31 SE NW NE	25098	f5	-7	-275	-727	-1127	-1578	-2401	-2749	-----	
SEC. 31 NW SE NE	25301	-6	-20	-285	-744	-1147	-1586	-2406	-2753	-----	
SEC. 32 NW SE NE	22392	-3	-15	-279	-743	-1121	-1603	-2412	-2763	-3024	
SEC. 32 SE SE SE	22431	f13	-2	-268	-708	-1106	-1571	-2388	-2736	-2996	
SEC. 32 SE SW SE	23902	f3	-11	-276	-724	-1107	-1579	-2391	-2737	-2999	
SEC. 32 SE SW NW	24404	-15	-28	-294	-745	-1148	-1593	-2407	-2754	-----	
SEC. 32 SE NE SW	24465	f1	-12	-277	-727	-1119	-1592	-2401	-2750	-----	

LOCATION	STATE	PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 32 NW NW SW	24587	-1	-16	-283	-737	-1130	-1587	-2404	-2755		-----
SEC. 32 SE SE NW	24654	-11	-23	-290	-739	-1142	-1591	-2407	-2753		-3009
SEC. 32 NW SE SE	24688	41	-11	-279	-723	-1110	-1589	-2400	-2747		-3011
SEC. 32 SE NW SW	24745	-6	-18	-284	-738	-1138	-1594	-2403	-2745		-----
SEC. 32 NW SW SE	24765	-----	-----	-272	-719	-1114	-1579	-2390	-2739		-----
SEC. 32 SE SE SW	24931	0	-13	-279	-730	-1066	-1584	-2390	-2736		-2999
SEC. 32 SE NW NW	24966	-20	-32	-301	-752	-1161	-1603	-2420	-2766		-3026
SEC. 32 NW SW SW	25045	48	-4	-271	-721	-1114	-1584	-2395	-2743		-----
SEC. 32 NW NW NW	25046	-16	-28	-297	-767	-1170	-1603	-2417	-2767		-----
SEC. 32 SE SW SW	25131	45	-7	-273	-715	-1106	-1586	-2389	-2730		-----
SEC. 32 NW SW NW	25183	-15	-29	-296	-748	-1164	-1595	-2409	-2759		-2966
SEC. 33 SE SW SW	22780	-----	-----	-273	-719	-1109	-1577	-2393	-2741		-3005
SEC. 33 NW SW SW	23009	44	-9	-274	-725	-1118	-1577	-2394	-2741		-----
SEC. 1 SE NE NE	22048	-72	-86	-354	-863	-1301	-1788	-2582	-2941		-3204
SEC. 2 NW SW SW	21525	-65	-80	-344	-848	-1293	-1748	-2535	-2891		-----
SEC. 2 SE SE SW	21845	-----	-----	-----	-----	-----	-----	-2528	-2883		-----
SEC. 2 SW SW SW	22396	-65	-78	-345	-845	-1289	-1747	-2532	-2889		-----
SEC. 3 SE SE NE	20776	-----	-----	-354	-866	-1314	-1714	-2552	-2906		-----

T5S R3W

LOCATION		STATE PERMIT		SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC.	3 NW SE SW	20947	-65	-78	-345	-861	-1298	-1761	-2545	-2912	-----	-----
SEC.	3 SE SW SE	21131	-----	-----	-353	-----	-----	-----	-2547	-2892	-----	-----
SEC.	3 NW SW SE	21381	-67	-79	-349	-874	-1301	-1776	-2558	-2900	-----	-----
SEC.	3 SE NE SW	21520	-----	-----	-360	-893	-1350	-1784	-2571	-2908	-----	-----
SEC.	3 SE SW SW	21522	-----	-----	-----	-847	-1271	-1737	-2510	-2873	-----	-----
SEC.	3 SE NW SW	21566	-75	-87	-358	-881	-1332	-1765	-2554	-2893	-----	-----
SEC.	3 SE SW NE	21657	-----	-----	-341	-853	-1293	-1766	-2555	-2901	-----	-----
SEC.	3 SE SE NW	21689	-63	-77	-345	-877	-1306	-1789	-2578	-2909	-----	-----
SEC.	3 NW NE SW	21735	-67	-81	-348	-892	-1333	-1786	-2563	-2904	-----	-----
SEC.	3 NW NW SE	21786	-59	-72	-341	-866	-1313	-1765	-2558	-----	-----	-----
SEC.	3 SE NE NW	21832	-72	-85	-355	-891	-1277	-1789	-2577	-----	-----	-----
SEC.	3 SE NW SE	21913	-----	-----	-354	-871	-1298	-1773	-2566	-2899	-----	-----
SEC.	3 NW SE NW	21935	-67	-80	-351	-905	-1352	-1800	-2581	-----	-----	-----
SEC.	3 NW SW SW	22168	-55	-68	-341	-844	-1274	-1744	-2541	-2879	-----	-----
SEC.	3 NW NW SW	22192	-----	-----	-362	-902	-1352	-1771	-2561	-2900	-----	-----
SEC.	3 SE SW NW	22223	-73	-87	-359	-906	-1352	-1803	-2574	-2916	-----	-----
SEC.	3 SE SE SW	22238	-72	-86	-353	-863	-1304	-1774	-2554	-2892	-----	-----
SEC.	3 NW SE SE	22239	-----	-----	-358	-871	-1311	-1756	-2548	-2891	-----	-----

LOCATION		STATE PERMIT		SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC.	3	NW SW NW	22266	-67	-80	-354	-909	-1352	-1800	-2568	-2915	-----
SEC.	3	SE SE SE	22291	-----	-----	-352	-858	-1297	-1765	-2552	-2895	-----
SEC.	3	NW NE SE	22364	-----	-----	-356	-871	-1316	-1778	-2558	-2904	-----
SEC.	3	SE NW NW	22403	-66	-80	-352	-906	-1342	-1803	-2588	-2921	-----
SEC.	3	NW SE SW	22878	-65	-80	-347	-865	-1295	-1763	-2547	-----	-----
SEC.	4	SE SW NE	22201	-73	-88	-361	-882	-1318	-1772	-2557	-2914	-3171
SEC.	4	SE SE SE	22243	-65	-80	-343	-837	-1266	-1738	-2521	-2876	-----
SEC.	4	NW NE SE	22346	-----	-----	-----	-----	-----	-----	-2541	-2895	-----
SEC.	4	SE SE NE	22353	-----	-----	-358	-893	-1313	-1789	-2574	-2916	-----
SEC.	4	SE NE NE	22459	-----	-----	-352	-918	-1331	-1809	-2567	-2918	-----
SEC.	4	NE SE SE	22470	-----	-----	-----	-847	-1274	-1740	-2530	-2894	-----
SEC.	4	NW SE NE	22861	-71	-84	-357	-894	-1344	-1784	-2567	-----	-----
SEC.	4	SE NW NE	22900	-79	-93	-365	-908	-1353	-1789	-2576	-----	-----
SEC.	4	SE NE NW	23026	-80	-93	-364	-886	-1335	-1780	-2569	-----	-----
SEC.	4	NW SW NE	23270	-----	-----	-374	-908	-1305	-1771	-2560	-----	-----
SEC.	4	E ¹ / ₂ NW NW	23422	-----	-----	-354	-852	-1252	-1766	-2559	-2915	-3170
SEC.	4	NE SW NE	23957	-----	-----	-----	-----	-----	-----	-2573	-----	-----
SEC.	8	SE NE NW	20787	-----	-----	-345	-807	-1220	-1706	-2502	-2854	-----

LOCATION		STATE PERMIT										CL	TR	BR	GW
		SB	BB	TL	SL	NG	CL	TR	BR	GW					
SEC. 9	SE SE NE	20748	-65	-79	-345	-836	-1263	-1707	-2503	-2854	----				
SEC. 9	NW NW SW	20935	-70	-84	-350	-832	-1235	-1704	-2496	-2849	----				
SEC. 10	NW SE NE	19601	-56	-73	-344	-862	-1329	-1749	-2537	----					
SEC. 10	SE NW NE	20422	-62	-75	-348	-845	-1293	-1748	-2536	----					
SEC. 10	NW NW SE	20674	-57	-70	-337	-825	-1296	-1711	-2510	-2860	----				
SEC. 10	SE SW NE	20676	-----	-----	-----	-----	-----	-----	-2520	-2859	----				
SEC. 10	SE NE SW	20733	-51	-65	-331	-819	-1246	-1695	-2490	-2845	-3102				
SEC. 10	NW SW NE	20799	-56	-71	-336	-826	-1276	-1727	-2511	-2861	----				
SEC. 10	NW SE SE	21060	-45	-60	-325	-822	-1263	-1719	-2505	-2857	----				
SEC. 10	NW NW NW	21147	-19	-----	-339	-837	-1269	-1724	-2513	-2867	----				
SEC. 10	SE NE NE	21303	-----	-----	-----	-----	-----	-----	-2539	-2879	----				
SEC. 10	NW SW SE	21518	-----	-----	-----	-----	-----	-----	-2477	-2831	----				
SEC. 10	NW SE NE	21747	-----	-----	-----	-----	-----	-----	-2534	-2891	----				
SEC. 10	NW SE NW	21754	-----	-----	-336	-819	-1265	-1719	-2507	-2859	----				
SEC. 10	NW NE NW	22166	-----	-----	-----	-----	-----	-1728	-2515	-2865	----				
SEC. 10	SE SW SE	22268	-----	-----	-323	-809	-1247	-1700	-2486	-2841	-3093				
SEC. 10	SE NE NW	22301	-----	-----	-337	-837	-1265	-1734	-1847	-2514	-2869				
SEC. 10	NE NE NW	24371	-----	-----	-330	-837	-1254	-1736	-2523	----	----				

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 11 NW SW NW/	20703	-----	-----	-339	-----	-----	-1742	-2523	-2872	-----
SEC. 11 NW SW SW	20772	-----	-----	-295	-----	-----	-1720	-2517	-2857	-----
SEC. 11 SE SW SW	20851	-42	-56	-323	-826	-1244	-1716	-2504	-2849	-----
SEC. 11 NW NW SE	20950	-43	-57	-322	-813	-1232	-1702	-2497	-2852	-----
SEC. 11 SE SE NW/	21269	-----	-----	-331	-825	-1211	-1708	-2511	-2855	-----
SEC. 11 NW NW NW/	21304	-61	-77	-344	-830	-1262	-1747	-2543	-2899	-----
SEC. 11 NW NE SW	21354	-----	-----	-325	-816	-1205	-1712	-2507	-2856	-----
SEC. 11 SE NW NW/	21380	-----	-----	-342	-839	-1237	-1739	-2527	-2872	-----
SEC. 11 NW SE NE	21946	-53	-66	-328	-818	-1225	-1711	-2510	-2865	-3123
SEC. 11 NW SE NW/	21974	-----	-----	-315	-811	-1214	-1697	-----	-----	-----
SEC. 11 SE SE SW	21988	-38	-51	-316	-815	-1225	-1700	-2489	-2843	-3096
SEC. 11 SW NE SW	22156	-33	-49	-313	-824	-1260	-1708	-2504	-----	-----
SEC. 11 SE NE SW	22778	-38	-52	-317	-816	-1249	-1709	-2497	-2850	-3105
SEC. 11 NW NE NW/	24781	-----	-----	-344	-824	-1280	-1731	-2522	-2878	-3138
SEC. 12 NW SW SE	20909	-31	-47	-316	-791	-1207	-1685	-2489	-2844	-----
SEC. 12 NW SW NW/	21572	-49	-63	-330	-822	-1264	-1721	-2512	-2867	-----
SEC. 13 SE SW SW	23048	-9	-24	-287	-784	-1189	-1657	-2456	-2808	-3062
SEC. 13 SE SE SW	23306	-8	-22	-286	-779	-1178	-1655	-2458	-2811	-3070

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 13 NW SW SW	23794	-32	-46	-307	-800	-1247	-1674	-2465	-2815	-3074
SEC. 13 SE SW SE	24769	-13	-26	-292	-774	-1191	-1662	-2463	-2816	-3077
SEC. 14 NW NE NE	20890	-----	-----	-260	-792	-1201	-1686	-2476	-2830	-----
SEC. 14 NW NE NW	20938	-35	-49	-313	-821	-1230	-1706	-2491	-2839	-----
SEC. 14 SE NE NW	21113	-----	-----	-305	-800	-1177	-1696	-2482	-2834	-3082
SEC. 14 SE NW NW	21129	-----	-----	-----	-816	-----	-1707	-2493	-2837	-----
SEC. 14 NW SW NW	21215	-----	-----	-----	-786	-1190	-1688	-2482	-----	-----
SEC. 14 SE SW NW	21305	-----	-----	-----	-----	-----	-1686	-2488	-2847	-----
SEC. 14 SE NW SW	21315	-----	-----	-307	-----	-----	-1771	-2453	-----	-----
SEC. 14 SE SE NW	21336	-----	-----	-303	-808	-1249	-1704	-2494	-2832	-----
SEC. 14 SE SW SW	21553	-----	-----	-----	-----	-----	-----	-2473	-2819	-----
SEC. 14 NW NE SW	21579	-10	-23	-289	-793	-1236	-1689	-2479	-2820	-----
SEC. 14 NW SE NW	21640	-23	-39	-303	-811	-----	-1746	-2495	-2842	-----
SEC. 14 SE NE SW	21743	-----	-----	-294	-801	-1310	-1689	-2483	-2822	-----
SEC. 14 SE NW SE	21755	-14	-30	-295	-783	-1221	-1686	-2487	-2830	-----
SEC. 14 SE SE SW	22059	-----	-----	-286	-800	-1230	-1672	-2468	-2813	-----
SEC. 14 NW SE SW	22114	-----	-----	-290	-785	-1258	-1668	-2455	-2807	-----
SEC. 14 SE SW NE	22169	-23	-37	-300	-805	-1213	-1695	-2503	-----	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 14 SE SW SE	22283	-----	-----	-----	-----	-----	-----	-2473	-2818	-----
SEC. 14 NW SW NE	22518	-29	-44	-309	-812	-1229	-1691	-2488	-2829	-----
SEC. 14 NW SE SE	22813	-15	-29	-293	-796	-1211	-1679	-2471	-2823	-----
SEC. 14 SE SE SE	22862	-----	-----	-----	-----	-----	-----	-----	-2810	-3056
SEC. 14 NW NE SE	22920	-26	-41	-305	-804	-1260	-1690	-2473	-2821	-----
SEC. 14 SE NE SE	23052	-----	-----	-298	-781	-1106	-1675	-2471	-2824	-3089
SEC. 14 NW NE NW	23519	-----	-----	-307	-819	-1256	-1702	-2491	-2841	-----
SEC. 14 SE NW NE	23810	-----	-----	-302	-805	-1223	-1681	-2473	-2776	-3080
SEC. 14 NW SE NE	23906	-25	-37	-302	-791	-1207	-1677	-2472	-2825	-3078
SEC. 14 SW NE SE	24226	-14	-29	-292	-793	-1212	-1674	-2472	-2821	-----
SEC. 14 NW SW SE	24934	-11	-22	-286	-792	-1212	-1684	-2480	-2824	-----
SEC. 15 NW SE NE	20773	-18	-31	-296	-761	-1195	-1665	-2458	-2810	-----
SEC. 15 NW NW NW	21317	-----	-----	-328	-806	-1206	-----	-----	-----	-----
SEC. 15 SE SE NE	21554	-----	-----	-----	-766	-1174	-1667	-2455	-2805	-2931
SEC. 15 NW NE NE	21975	-57	-69	-332	-809	-1218	-1712	-2478	-2819	-3066
SEC. 21 SW SW SW	21225	-----	-----	-292	-749	-1156	-1635	-2396	-2744	-----
SEC. 23 NW NW SW	21344	-3	-18	-287	-739	-1139	-1610	-2412	-2762	-----
SEC. 23 SE NW SE	21595	112	-2	-267	-732	-1142	-1612	-2420	-2769	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 23 SE NE NW	21791	f4	-11	-274	-746	-1163	-1639	-2435	-2787	-3053
SEC. 23 NW SE SE	21833	-----	-----	-270	-747	-1149	-1617	-2418	-2765	-----
SEC. 23 SE SE NW	21902	f6	-9	-278	-742	-1140	-1625	-2433	-----	-----
SEC. 23 SE SW SE	21918	f15	f1	-267	-749	-1134	-1607	-2406	-2754	-3009
SEC. 23 SE SW NE	21931	-----	-----	-289	-763	-1053	-1640	-2438	-2787	-----
SEC. 23 SE NE SW	21989	-----	-----	-275	-726	-1127	-1603	-2406	-2756	-3013
SEC. 23 SE SE SE	22--4	-----	-----	-268	-751	-1116	-1620	-2422	-2768	-----
SEC. 23 NW NE SE	22113	-----	-----	-278	-763	-----	-1631	-2439	-2789	-----
SEC. 23 NW SE NW	22161	f3	-11	-275	-734	-1145	-1624	-2419	-2771	-----
SEC. 23 NW SW SE	22167	f19	f8	-255	-711	-1107	-1593	-2394	-2744	-2997
SEC. 23 NW SE NE	22194	-----	-----	-292	-785	-1195	-1662	-2464	-2811	-----
SEC. 23 SE NE SE	22240	-----	-----	-276	-752	-1147	-1631	-2434	-2786	-----
SEC. 23 NE NE SW	22244	f8	-8	-274	-734	-1143	-1614	-2412	-2763	-----
SEC. 23 SE NW NE	22381	-3	-16	-281	-773	-1228	-1654	-2509	-2803	-----
SEC. 23 NW NE NE	22421	-10	-25	-290	-787	-1190	-1658	-2448	-2801	-----
SEC. 23 SE SE NE	22465	-----	-----	-298	-791	-1215	-1646	-2444	-2795	-----
SEC. 23 NW NW NE	22507	-----	-----	-277	-756	-1185	-1660	-2462	-----	-----
SEC. 23 NW SW NE	22565	-----	-----	-276	-749	-1157	-1659	-2444	-2793	-----

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 23 NW NE NW	22567	4	-10	-282	-743	-1160	-1642	-2436	-2788	-3041
SEC. 23 SE NE NE	22965	-8	-20	-285	-785	-1196	-1641	-2444	-2795	-----
SEC. 23 SW NE NE	23943	-9	-22	-288	-785	-1200	-1647	-2448	-2801	-----
SEC. 23 NE NE NE	23944	-----	-----	-296	-785	-1195	-1663	-2453	-2808	-----
SEC. 24 NW SW NW	21332	-----	-----	-----	-641	-----	-1643	-2447	-----	-----
SEC. 24 NW SW SW	21941	-----	-----	-293	-758	-1152	-1619	-2427	-2780	-----
SEC. 24 NW NW NW	22104	-13	-27	-298	-785	-1198	-1660	-2462	-----	-----
SEC. 24 NW SE NW	22182	-9	-22	-290	-779	-1184	-1640	-2442	-2792	-----
SEC. 24 NW SW NW	22320	-----	-----	-----	-----	-----	-1644	-2442	-2795	-----
SEC. 24 NW NW SW	22458	-2	-17	-285	-766	-1171	-1624	-2429	-2781	-3037
SEC. 24 NW NE NW	22881	-11	-24	-290	-775	-1197	-1661	-2462	-2813	-----
SEC. 24 NW SE SE	22985	4	-10	-278	-731	-1145	-1608	-2420	-2772	-3038
SEC. 24 SE NW NW	23050	-22	-35	-309	-788	-1201	-1658	-2456	-2809	-3065
SEC. 24 NW SW NE	23220	-4	-18	-287	-763	-1167	-1648	-2451	-2803	-3056
SEC. 24 NE NW NW	23790	-15	-29	-295	-791	-1191	-1661	-2462	-2812	-----
SEC. 24 SE NE NW	23939	-----	-----	-299	-785	-1212	-1652	-2454	-2805	-----
SEC. 24 NW NW NE	24083	-----	-----	-288	-774	-1188	-1657	-2455	-2807	-----
SEC. 24 SE NW NE	24187	-7	-22	-290	-758	-1177	-1652	-2454	-2805	-----

LOCATION		STATE PERMIT				TL	SL	NG	CL	TR	BR	GW
SEC. 24	SW NW SW	24344	✓6	-8	-270	-751	-1136	-1630	-2422	-2778	-3037	
SEC. 24	NW SE NE	24450	-11	-24	-290	-779	-1181	-1650	-2443	-2794	-3052	
SEC. 24	NW NE NE	24574	-18	-32	-302	-765	-1188	-1660	-2465	-2817	-----	
SEC. 24	SE NE NE	24575	-18	-31	-302	-771	-1200	-1648	-2458	-2815	-----	
SEC. 24	NW NE NE	24972	-16	-30	-306	-772	-1182	-1665	-2466	-----	-----	
SEC. 25	NW NW NW	21629	✓21	✓9	-214	-734	-----	-1609	-2411	-----	-----	
SEC. 25	NW SE NW	21760	✓24	✓10	-254	-724	-1113	-1606	-2417	-2764	-----	
SEC. 25	SE SE NW	21761	✓10	-4	-270	-735	-1132	-1616	-2431	-2764	-----	
SEC. 25	NW NW SE	21928	✓27	✓13	-255	-738	-1121	-1585	-2395	-----	-----	
SEC. 25	NW NE NW	22005	-----	-----	-269	-748	-1086	-1623	-2428	-2765	-----	
SEC. 25	SE NW SE	22022	-----	-----	-----	-----	-----	-1595	-2400	-2750	-----	
SEC. 25	SE NE SW	22080	✓20	✓6	-257	-716	-1117	-1584	-2391	-2737	-----	
SEC. 25	NW SW SE	22087	✓21	✓11	-258	-718	-1116	-1578	-2398	-2726	-----	
SEC. 25	NW SW NW	22142	-----	-----	-268	-730	-1133	-1610	-2406	-2755	-----	
SEC. 25	NW NE SE	22164	✓27	✓14	-252	-720	-1103	-1586	-2387	-2739	-3003	
SEC. 25	SE NW NW	22191	-----	-----	-262	-723	-1133	-1605	-2405	-2744	-----	
SEC. 25	NW NE SW	22193	-----	-----	-259	-734	-1115	-1604	-2410	-2756	-----	
SEC. 25	SE SW SE	22196	✓31	✓18	-246	-710	-1108	-1577	-2380	-2728	-----	

LOCATION	STATE PERMIT	SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC. 25 SE NE NW	22274	f16	f3	-260	-735	-1119	-1606	-2408	-2760	-----
SEC. 25 SE NW SW	22305	-----	-----	-320	-738	-1126	-1586	-2392	-2741	-3000
SEC. 25 SE SE SW	22382	-----	-----	-267	-727	-1110	-1581	-2384	-2733	-----
SEC. 25 NW SE SE	22462	f29	f15	-249	-722	-1107	-1581	-2381	-2729	-----
SEC. 25 SW SW NE	23061	f25	f7	-258	-738	-1120	-1598	-2408	-2775	-----
SEC. 25 NE NW SW	23309	f18	f4	-261	-721	-1113	-1601	-2403	-2752	-----
SEC. 25 NW SE SW	24780	f15	f1	-263	-714	-1067	-1576	-2380	-2728	-----
SEC. 26 SE NW SE	21695	f14	-1	-265	-712	-1110	-1565	-2373	-2722	-----
SEC. 26 SE NE NE	21889	-----	-----	-270	-740	-1132	-1607	-2410	-2756	-----
SEC. 26 NW NE NE	22892	f10	-5	-269	-730	-1141	-1601	-2404	-2754	-----
SEC. 26 SE NW NE	23025	f7	-6	-268	-725	-1131	-1590	-2401	-2750	-----
SEC. 26 SE SE NE	24535	f14	0	-263	-718	-1112	-1597	-2394	-2743	-2999
SEC. 27 NE SE NE	21362	-----	-----	-283	-722	-----	-----	-2387	-2737	-----
SEC. 36 NW NE NE	22438	f28	f15	-251	-716	-1117	-1573	-2374	-2723	-----
SEC. 36 SE NE NE	22515	f26	f13	-253	-717	-1108	-1564	-2370	-2716	-----
SEC. 36 SE SE NE	22596	-----	-----	-251	-704	-1063	-1547	-2355	-2702	-----
SEC. 36 NW SE NE	22636	f27	f13	-251	-696	-1104	-1549	-2353	-2700	-2963
SEC. 36 SE NW NE	22971	f30	f26	-247	-696	-1104	-1549	-2358	-2709	-2972

LOCATION		STATE PERMIT			SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC.	36 SE SE SE	23118	48	436	436	-228	-659	-1051	-1511	-2323	-2670	-2933	
SEC.	36 SE NE SE	23349	41	428	428	-234	-667	-1044	-1527	-2337	-2684	-2949	
SEC.	36 NE NW NE	24793	34	421	421	-244	-693	-1087	-1556	-2362	-2713	-2976	
T6S R2W	SEC. 3 NW NE SW	23750	32	49	49	-257	-726	-1126	-1554	-2370	-2717	-2943	
SEC.	3 NW NW SW	24036	22	411	411	-257	-724	-1122	-1560	-2376	-2723	-----	
SEC.	3 SE NE SW	24091	-----	-----	-----	-246	-721	-1134	-1548	-2362	-2708	-----	
SEC.	3 SE NW SW	24460	25	413	413	-251	-724	-1138	-1556	-2367	-2711	-2969	
SEC.	3 NE SE SW	24636	25	412	412	-253	-729	-1128	-1548	-2363	-2707	-----	
SEC.	3 SE SW NW	24689	26	413	413	-245	-719	-1120	-1559	-2375	-2724	-2938	
SEC.	3 SE SW SW	24723	25	412	412	-251	-720	-1120	-1546	-2359	-2703	-----	
SEC.	3 SW SW SE	24729	-----	-----	-----	-251	-718	-1134	-1543	-2360	-2707	-2973	
SEC.	3 SE SW SE	24813	-----	-----	-----	-----	-----	-----	-----	-2361	-2708	-2979	
SEC.	3 SE SE SW	25077	26	413	413	-251	-723	-1137	-1541	-2356	-2702	-----	
SEC.	4 SE NW NW	22297	47	-7	-7	-271	-729	-1109	-1573	-2387	-2732	-----	
SEC.	4 NW NE NW	22365	42	-11	-11	-278	-725	-1118	-1577	-2391	-2739	-----	
SEC.	4 NW SE NW	22625	412	0	0	-266	-719	-1099	-1567	-2376	-2723	-2987	
SEC.	4 NW SW NW	23049	415	42	42	-260	-734	-1096	-1562	-2373	-2720	-2984	
SEC.	4 NW NE SW	23066	46	-6	-6	-270	-710	-1109	-1557	-2365	-2713	-2988	

LOCATION		STATE PERMIT										CL	TR	BR	GW
				SB	BB	TL	SL	NG	CL	TR	BR	GW			
SEC.	4	NW SW SE	23174	-----	-----	-----	-----	-----	-----	-2393	-2747	-----			
SEC.	4	SE NE NW	23357	f11	-1	-268	-721	-1100	-1571	-2389	-2738	-----			
SEC.	4	NW SE NE	23716	f34	f20	-246	-699	-1088	-1569	-2376	-2725	-2992			
SEC.	4	SE SW NE	23717	-----	-----	-251	-706	-1095	-1508	-2370	-2719	-----			
SEC.	4	NW NW SE	23925	f15	f1	-265	-713	-1110	-1555	-2366	-2712	-2978			
SEC.	4	NW NE SE	23990	f31	f18	-247	-705	-1108	-1555	-2366	-2712	-2976			
SEC.	4	SE NW NE	24115	f19	f7	-260	-709	-1111	-1577	-2387	-2735	-----			
SEC.	4	SE SE NE	24144	f32	f18	-250	-704	-1094	-1560	-2374	-2721	-----			
SEC.	4	SE NE SE	24312	f32	f19	-249	-712	-1118	-1550	-2363	-2722	-----			
SEC.	4	SE SE SE	24432	f29	f15	-249	-715	-1124	-1534	-2345	-2690	-2953			
SEC.	4	NW NW NE	24459	f15	f1	-271	-724	-1116	-1577	-2398	-2746	-3011			
SEC.	4	SW SE NE	24484	f29	f19	f251	-702	-1087	-1572	-2377	-2725	-----			
SEC.	4	SW NW NE	24550	f15	f2	-262	-710	-1108	-158	-2388	-2738	-2995			
SEC.	5	NE NE NE	24708	-----	-----	-271	-718	-1104	-1585	-2398	-2749	-----			
SEC.	5	NW NE NW	24801	-----	-----	-266	-723	-1108	-1567	-2379	-2726	-----			
SEC.	5	NW NW NE	24899	0	-15	-281	-738	-1113	-1577	-2394	-2737	-----			
SEC.	5	SE NE NW	24959	-----	-----	-276	-725	-1108	-1573	-2384	-2732	-2995			
SEC.	5	SE NW NE	24979	f2	-11	-277	-726	-1108	-1585	-2391	-2738	-3001			

LOCATION		STATE PERMIT				SB	BB	TL	SL	NG	CL	TR	BR	GW
SEC.	5	NW NW NW	25160	f5	-8	-275	-718	-1105	-1583	-2384	-2731	-2988		
SEC.	6	NW NE SW	22136	f48	f35	-225	-667	-1063	-1484	-2296	-2642	-2908		
SEC.	6	NW NE NE	24073	f8	-6	-269	-714	-1122	-1557	-2376	-2724	-2986		
SEC.	6	NW SW NE	24792	f42	f28	-232	-678	-1048	-1525	-2333	-2682	-2948		
SEC.	7	SE SE SE	21834	f25	f13	-242	-678	-1083	-1497	-2313	-2655	-2919		
SEC.	7	NW NE NE	23018	f29	f15	-244	-689	-1087	-1519	-2332	-2680	-2947		
SEC.	7	SE SW NE	23875	f36	f22	-237	-669	-1080	-1494	-2312	-2656	-2925		
SEC.	8	SE SE SE	21751	f24	f12	-249	-691	-----	-1494	-2312	-2655	-----		
SEC.	8	SE SW NE	21956	f29	f17	-245	-689	-1061	-1525	-2333	-2675	-2939		
SEC.	8	SE NE NW	22019	f24	f11	-249	-649	-1060	-1533	-2344	-2680	-2954		
SEC.	8	SE NW SE	22038	f13	f3	-259	-704	-1109	-1522	-2332	-2673	-2934		
SEC.	8	SE NE SE	22137	f27	f12	-251	-686	-1101	-1516	-2327	-2670	-2937		
SEC.	8	NW NW NW	22510	f14	f2	-260	-700	-1094	-1531	-2347	-2693	-2955		
SEC.	8	SE SW SE	22732	f21	f10	-252	-694	-1118	-1498	-2317	-2658	-----		
SEC.	8	NW NE NW	23180	f30	f18	-242	-690	-1059	-1530	-2339	-2685	-2947		
SEC.	8	SE NW NE	23298	f22	f10	-250	-686	-1074	-1534	-2347	-2691	-2955		
SEC.	8	SE SE NW	24084	f23	f11	-250	-687	-1097	-1527	-2339	-2681	-2947		
SEC.	8	SE NE SW	24791	f19	f7	-257	-691	-1124	-1516	-2328	-2670	-----		

LOCATION		STATE PERMIT				BB	TL	SL	NG	CL	TR	BR	GW
SEC. 8	NW SW SE	24964	f23	f10	-253	-697	-1105	-1511	-2323	-2662	-----		
SEC. 8	NW SE NW	25036	f17	f3	-255	-698	-1090	-1531	-2345	-2684	-----		
SEC. 8	SE SW NW	25076	f16	f3	-259	-705	-1120	-1519	-2331	-2675	-2940		
SEC. 8	SE SE SW	25159	f28	f13	-247	-679	-1091	-1497	-2312	-2653	-2919		
SEC. 8	SE NW SW	25197	f20	f6	-256	-686	-1127	-1508	-2328	-2680	-2950		
SEC. 8	NW NW SW	25212	f22	f9	-253	-699	-1123	-1510	-2323	-2665	-2931		
SEC. 9	NW SW NW	21957	f13	f2	-262	-705	-1109	-1525	-2338	-2683	-2948		
SEC. 9	NW SW SW	22045	f38	f22	-240	-689	-1103	-1494	-2311	-2644	-----		
SEC. 10	SE NW NE	22597	f38	f25	-237	-703	-1111	-1518	-2333	-2679	-2946		
SEC. 10	SE NE SW	22677	f39	f27	-238	-699	-1108	-1507	-2324	-2668	-2943		
SEC. 10	NW NW NE	24531	f27	f15	-249	-714	-1117	-1537	-2350	-2694	-----		
SEC. 10	SE NW NE	24641	f29	f17	-247	-713	-1121	-1523	-2339	-2685	-----		
SEC. 10	NW SE NE	24663	f30	f19	-245	-711	-1125	-1523	-2340	-2684	-2984		
SEC. 10	NW NW NW	24666	f23	f10	-254	-724	-1130	-1541	-2353	-2699	-2965		
SEC. 10	NW NE NE	24903	-----	-----	-----	-----	-----	-----	-2357	-2702	-2971		
SEC. 10	NW NE NW	24916	f26	f14	-252	-718	-1131	-1536	-2351	-2696	-----		
SEC. 10	NE NE NW	25003	-----	-----	-----	-----	-----	-----	-2347	-2693	-2955		
SEC. 15	NW NW SE	21990	f52	f40	-219	-664	-1072	-1472	-2290	-2631	-2900		

LOCATION		STATE PERMIT				BB	TL	SL	NG	CL	TR	BR	GW
SEC. 15	SE NW SW	22095	f54	f41	-221	-662	-1058	-1464	-2283	-2624	-2889		
SEC. 16	NW SE NW	21851	f29	f18	-247	-676	-1104	-1490	-2306	-2647	-2914		
SEC. 16	SE NE SE	22029	f45	f34	-230	-647	-1059	-1467	-2282	-2623	-2891		
SEC. 16	NW SW NW	22070	f30	f18	-245	-674	-----	-1484	-2300	-2640	-2902		
SEC. 16	NW NE NW	22097	f23	f10	-251	-678	-1100	-1496	-2315	-2658	-2920		
SEC. 16	NW NW NW	22204	f27	f14	-248	-686	-1068	-1495	-2308	-2650	-2916		
SEC. 16	NW NW SW	23273	f53	f39	-218	-645	-1027	-1470	-2287	-2624	-----		
SEC. 16	SE SW NW	23413	f38	f26	-234	-666	-1068	-1479	-2298	-2638	-----		
SEC. 17	NW SE NE	21286	f35	f23	-239	-677	-1077	-1481	-2304	-2641	-----		
SEC. 17	NW NE NE	22200	f26	f13	-253	-693	-1103	-1497	-2318	-2652	-----		
SEC. 17	NW NW NE	22751	f27	f14	-245	-708	-1086	-1490	-2306	-2648	-2912		
SEC. 17	SE NE NE	22757	f35	f24	-250	-680	-1099	-1494	-2311	-2649	-----		
SEC. 17	NW NW SE	22833	f45	f31	-223	-646	-1037	-1472	-2290	-2630	-2896		
SEC. 17	NW SE NE	23006	f34	f21	-239	-670	-1069	-1487	-2300	-2639	-2903		
SEC. 17	SE NW NE	23175	f35	f21	-239	-668	-1073	-1481	-2297	-2638	-2908		
SEC. 17	SE SE NE	23319	f51	f36	-223	-657	-1048	-1470	-2287	-2627	-2894		
SEC. 18	NW NE NE	24169	f35	f22	-233	-654	-1065	-1483	-2307	-2652	-2914		
SEC. 1	NW NW SW	25078	f56	f42	-217	-646	-1027	-1490	-2299	-2645	-2910		
SEC. 12	SE SW NE	23079	f71	f58	-196	-602	-1003	-1463	-2273	-2627	-2883		

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