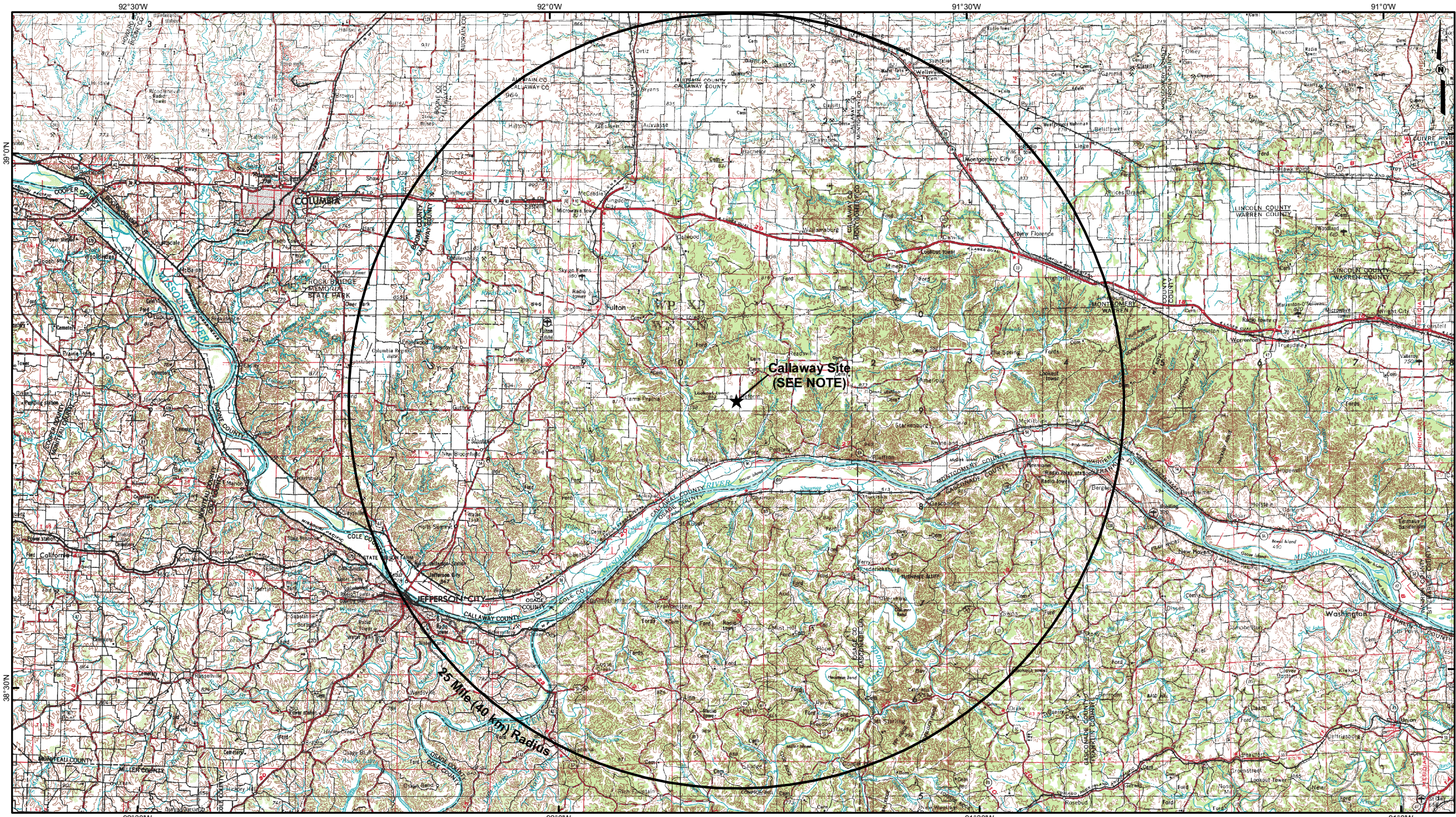


Figure 2.5L-1—{Site Region Relief Map}
200 Mile (320 km) Radius



Figure 2.5L-2—{Site Vicinity Topographic Map}
25 Mile (40 km) Radius



Contour Interval = 100 feet
Supplementary Contours = 50 feet

NOTE:
REFERENCE CENTER POINT OF PLANT SITE
IS DEFINED AS THE MIDPOINT BETWEEN EXISTING
REACTOR FOR CALLAWAY PLANT UNIT 1 AND
REACTOR FOR CALLAWAY PLANT UNIT 2.

REFERENCE:
USGS, 1970.
USGS, 1989.
USGS, 1969a.
USGS, 1969b.

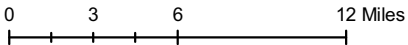


Figure 2.5L-3—{Site Map With Existing Callaway Plant Unit 1 and Proposed Callaway Plant Unit 2 Buildings}

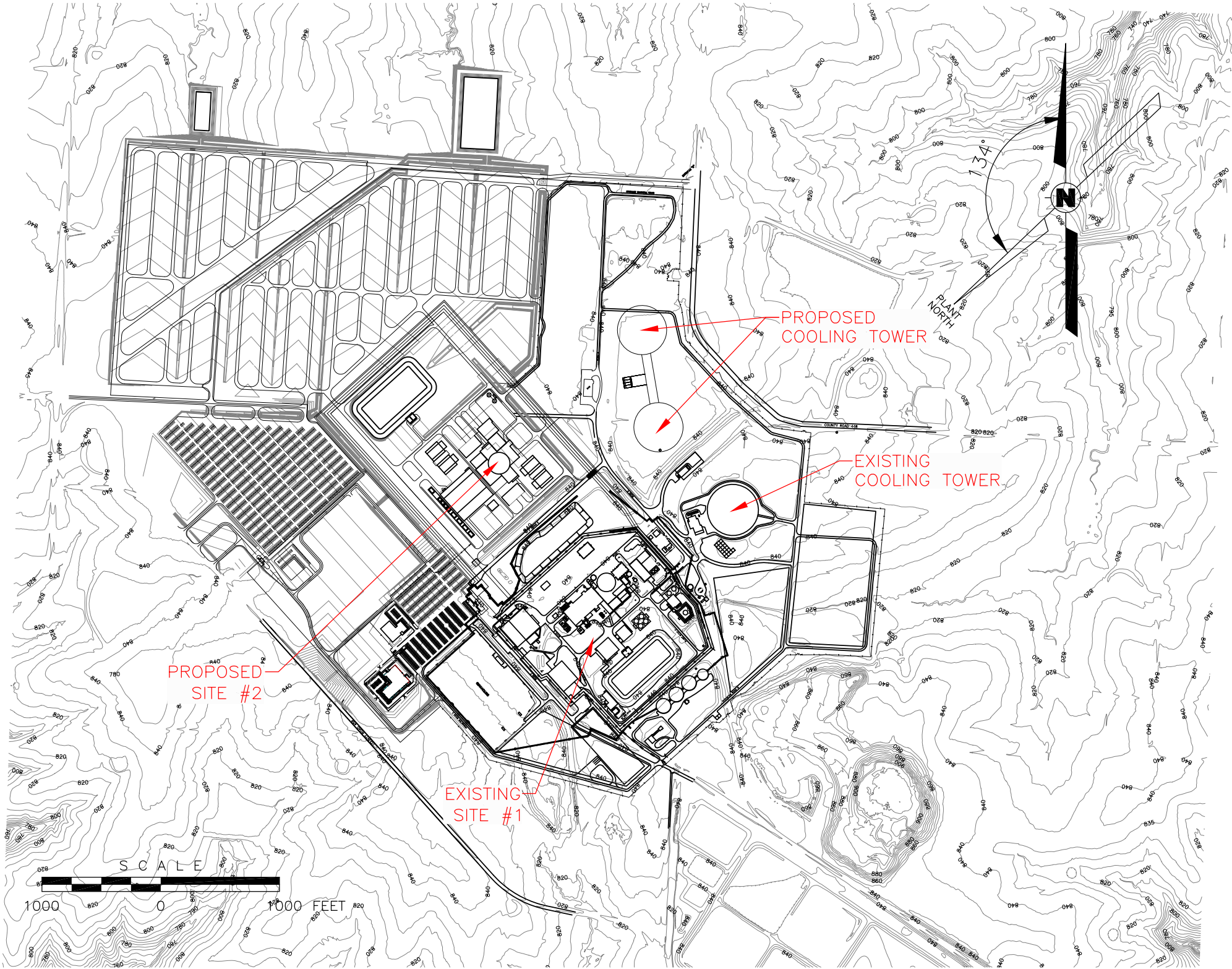


Figure 2.5L-4—{Regional Geologic Map}
200 Mile 320 km Radius

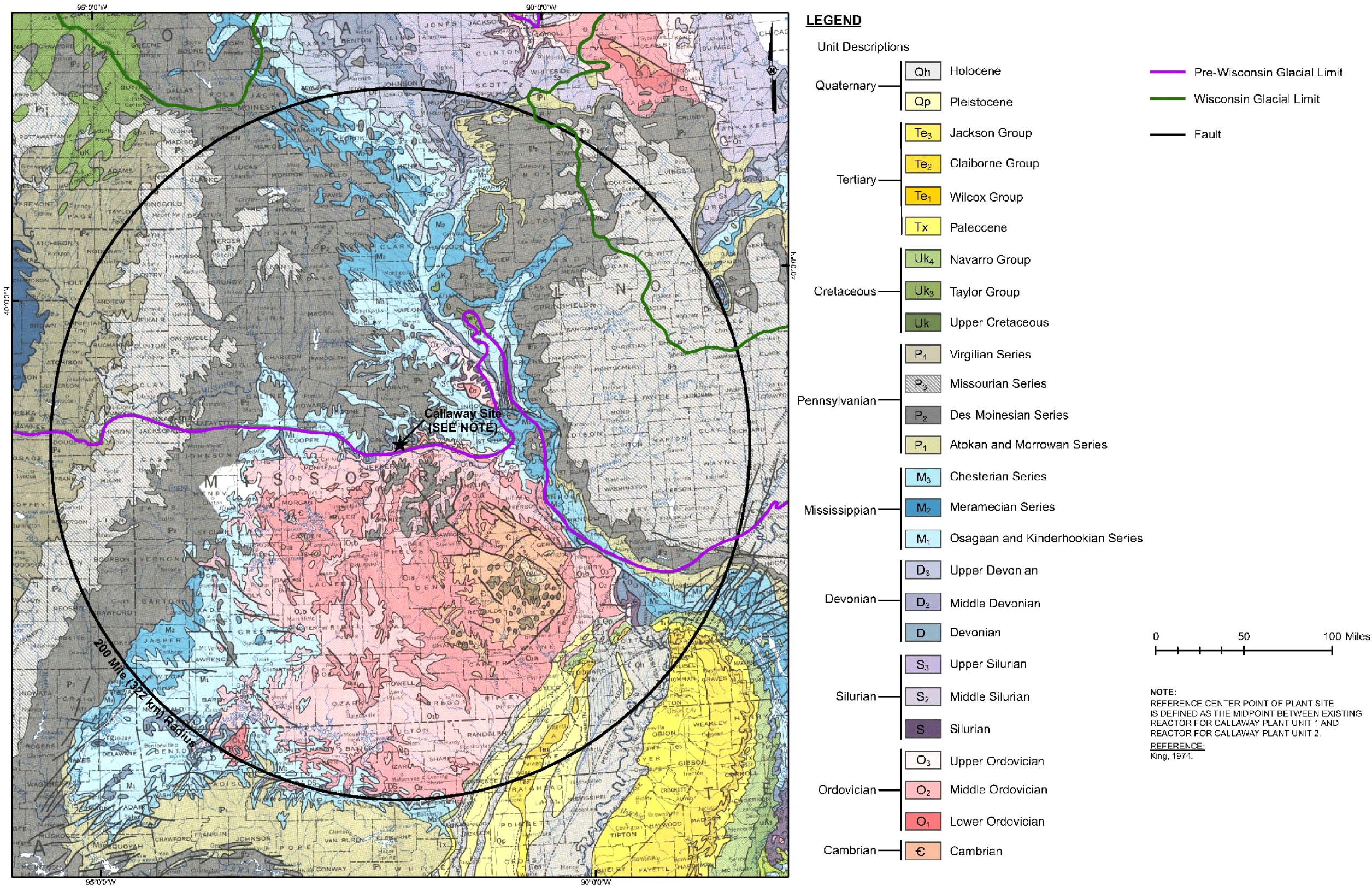
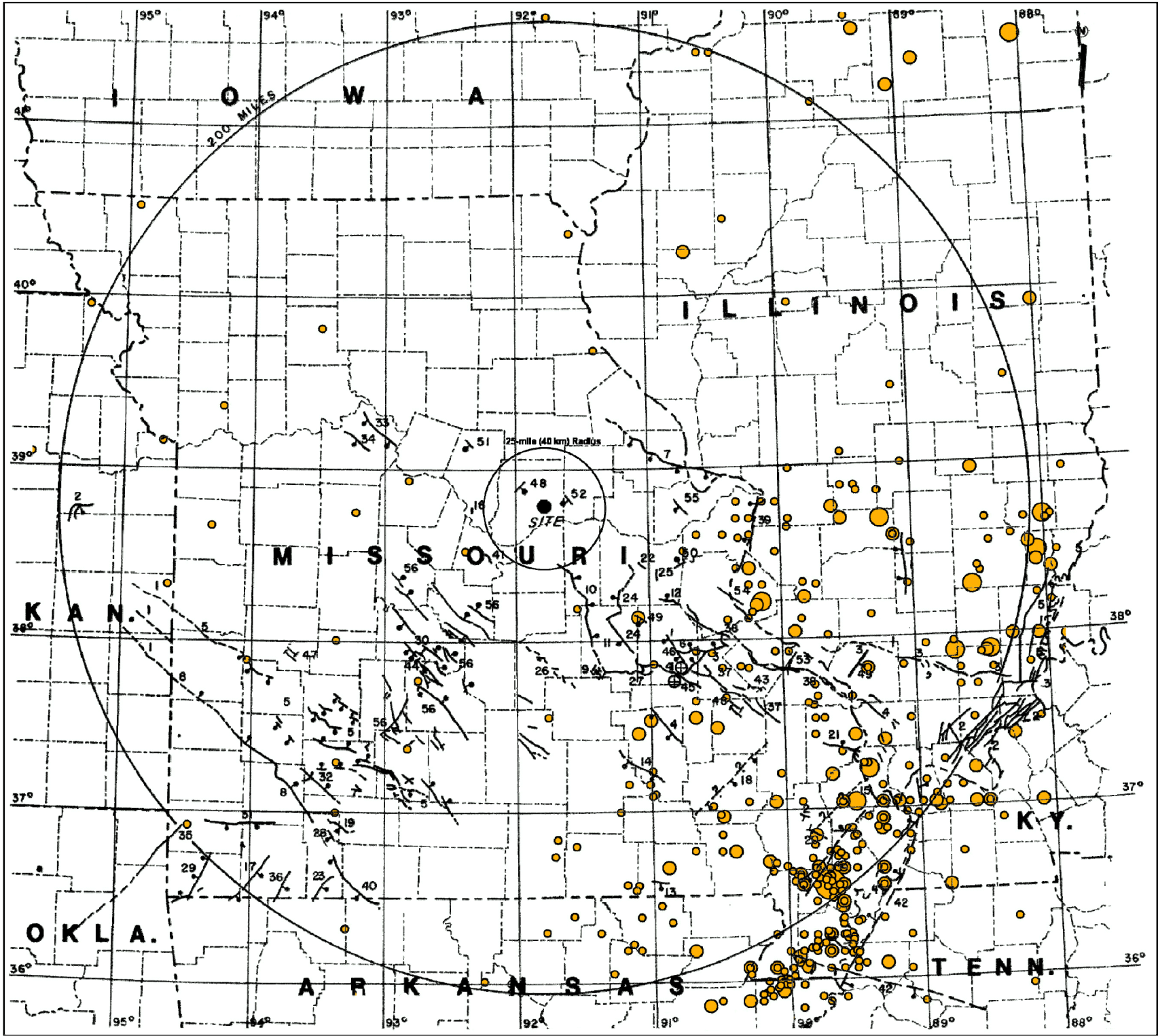


Figure 2.5L-5—{Regional Faulting and Earthquake Epicenters}



LIST OF FEATURES BY STATE:

ILLINOIS:

- 1. Centralia Fault
- 2. Fluorspar Area Complex
- 3. Rough Creek Lineament
- 4. St. Genevieve
- 5. Wabash Valley

MISSOURI:

- 1. Apts Fault
- 2. Aquilla Fault
- 3. Big River Fault System
- 4. Black Fault
- 5. Bolivar-Mansfield
- 6. Cabanne Fault
- 7. Cap au Gres Faulted Flexure
- 8. Chesapeake Fault
- 9. Crooked Creek Structure
- 10. Cuba Fault
- 11. Cuba Graben
- 12. Ditch Creek Fault System
- 13. Doniphan Fault
- 14. Ellington Fault
- 15. English Hill Fault
- 16. Fox Hollow Fault
- 17. Greasy Creek Fault
- 18. Greenville Fault
- 19. Highlandville Fault
- 20. Idalia Fault
- 21. Jackson Fault
- 22. Jeffriesburg Fault
- 23. Lampe Fault
- 24. Leasburg Fault
- 25. Moselle Fault
- 26. Newburg Fault
- 27. Palmer Fault System
- 28. Ponce de Leon Fault
- 29. Pineville Fault
- 30. Red Arrow Fault
- 31. Ritchey Fault
- 32. Sac River Fault
- 33. Saline City Fault
- 34. Salt Fork Fault
- 35. Seneca Fault
- 36. Shell Knob-Eagle River Structure
- 37. Simms Mountain
- 38. Ste. Genevieve Fault System
- 39. St. Louis Fault

MISSOURI (Continuation):

- 40. Ten O'Clock Run Fault
- 41. Wardsville Fault
- 42. Mississippi Valley
- 43. Avon Diatremes (dikes)
- 44. Decaturville Structure
- 45. Dent Branch Structure
- 46. Furnace Creek Structure
- 47. Weaubleau Creek Structure Associated faults
- 48. Kingdom City Fault
- 49. Anthonies Mill Fault
- 50. Catawissa Fault
- 51. Browns Station Fault
- 52. Mineola Fault
- 53. Ste. Mary's Fault
- 54. Unnamed Fault (Jefferson County)
- 55. Unnamed Fault (St. Charles County)
- 56. Unnamed Fault (Lake of the Ozarks Region)

KANSAS:

- 1. Chesapeake Fault
- 2. Worden Fault

KENTUCKY:

- 1. Reelfoot Lake Fault

LEGEND

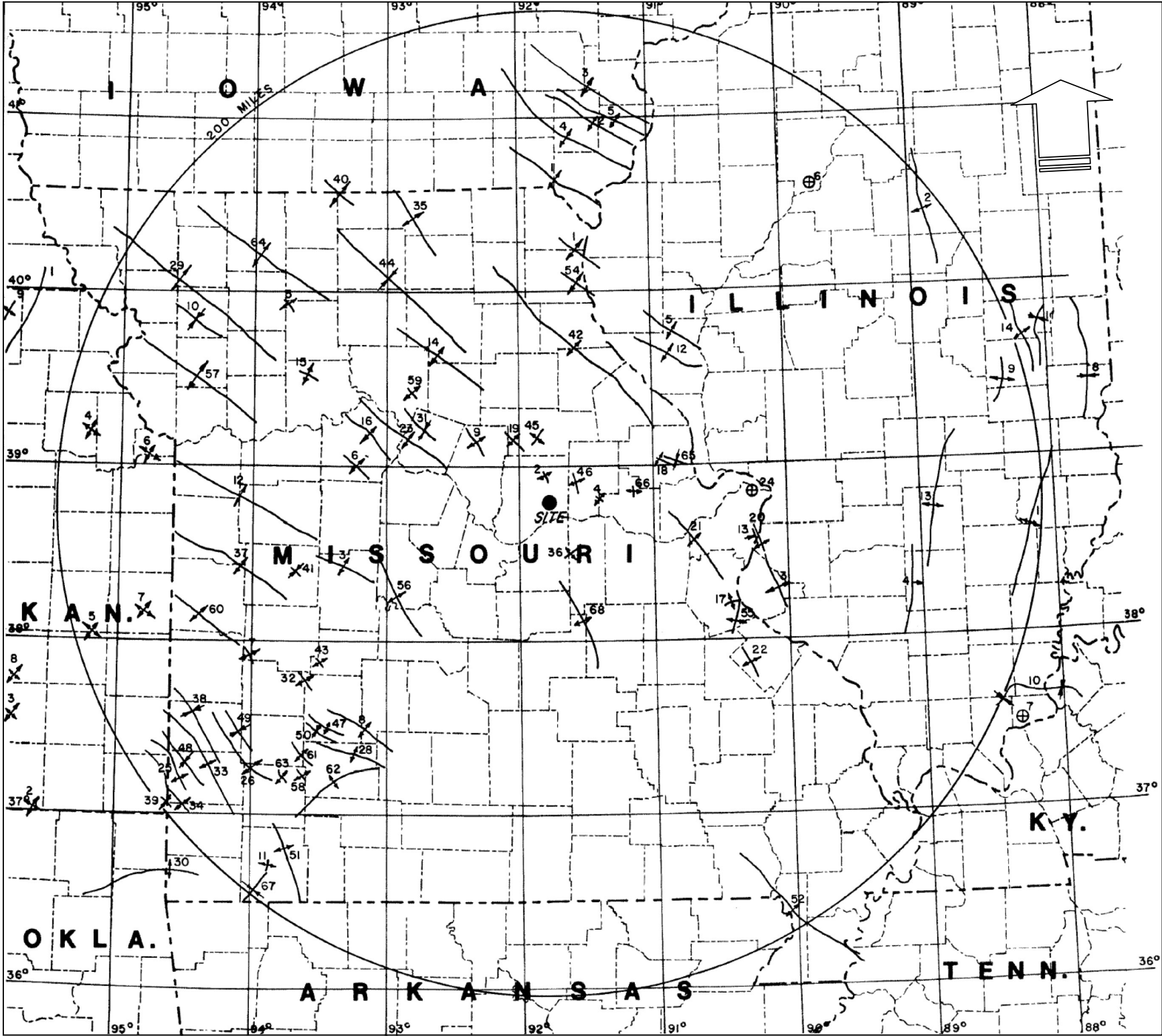
Earthquakes by Magnitude, mb

- 3.00000 - 3.90000
- 3.90001 - 4.90000
- 4.90001 - 5.90000
- 5.90001 - 6.90000
- 6.90001 - 7.90000



References: Figure 2.5-13 and Table 2.5-3, Callaway Plant Unit 1 FSAR (AmerenUE, 2004)
USGS (2002) updated catalog: http://www.earthquake.usgs.gov/research/hazmaps/products_data/2002/catalogs/

Figure 2.5L-6—{Regional Folding}



LIST OF FEATURES BY STATE:

ILLINOIS:

- 1. Clay City Anticline
- 2. Downs Anticline
- 3. Dupo-Waterloo Anticline
- 4. DuQuoin Monocline
- 5. Fishhook Anticline
- 6. Glasford Disturbance
- 7. Hicks Dome
- 8. Marshall Syncline
- 9. Mattoon Anticline
- 10. Moorman Syncline
- 11. Murdock Syncline
- 12. Pittsfield-Hadley Anticline
- 13. Salem-Louden Anticline
- 14. Tuscola Anticline

IOWA:

- 1. Bentonsport Anticline
- 2. Burlington Anticline
- 3. Oquawka Anticline
- 4. Skunk River Anticline
- 5. Sperry Anticline

KANSAS:

- 1. Brownville Syncline
- 2. Coffeyville Dome
- 3. Fredonia Dome
- 4. McLouth Dome
- 5. Mildred Dome
- 6. Morris Anticline
- 7. Mound City Dome
- 8. Rose Dome
- 9. Straham Anticline

MISSOURI:

- 1. Adams County Terrace
- 2. Auxvasse Creek Anticline
- 3. Benton County Anticline
- 4. Big Spring Anticline
- 5. Blackburn School Anticline
- 6. Blue Lick Anticline
- 7. Blue Ridge School Anticline
- 8. Bolivar-Mansfield Anticline
- 9. Browns Station Anticline
- 10. Cameron-Union Star Syncline
- 11. Cassville Anticline
- 12. Centerview-Kansas City Anticline
- 13. Cheltenham Syncline
- 14. College Mound-Bucklin Anticline
- 15. Coloma Anticline
- 16. Cow Creek Anticline
- 17. Crystal City Anticline
- 18. Cuivre Anticline
- 19. Davis Creek Anticline
- 20. Dupo Anticline

MISSOURI (Continuation):

- 21. Eureka-House Springs Anticline
- 22. Farmington Anticline
- 23. Fish Creek Anticline
- 24. Florissant Dome
- 25. Galesburg-Pittsburg
- 26. Golden City-Miller
- 28. Gradon-Northview Anticline
- 29. Hamilton-King City-Quitman Axis Anticline
- 30. Horse Creek Anticline
- 31. Howard County Syncline
- 32. Humansville Anticline
- 33. Jasper Anticline
- 34. Joplin Anticline
- 35. Kirksville-Mendota Anticline
- 36. Kruegers Ford Anticline
- 37. LaDue-Freeman Anticline
- 38. Lamar Syncline
- 39. Lawton Trough
- 40. Leon-Powersville
- 41. Lewis
- 42. Lincoln Fold
- 43. Little Weaubleau Anticline
- 44. Macon-Sullivan
- 45. Mexico Anticline
- 46. Mineola Dome
- 47. Morrisville-Brighton Fold
- 48. Nashville-Carthage Sag
- 49. Newport Basin
- 50. North Dry Sac Syncline
- 51. Osage-Verona Anticline
- 52. Pascola Arch
- 54. Pittsfield-Hadley Anticline
- 55. Platin Creek Anticline
- 56. Proctor Anticline
- 57. Richmond-St. Joseph Anticline
- 58. Sac River Anticline
- 59. Salsbury-Quitman Anticline
- 60. Schell City-Rich Hill Anticline
- 61. South Sac-Ash Grove Syncline
- 62. Springfield Anticline
- 63. Stinton Anticline
- 64. Trenton Anticline
- 65. Troy-Brussels Syncline
- 66. Warren County Anticline
- 67. Washburn Syncline
- 68. Cuba Anticline

LEGEND

- Anticline / Antiform
- Syncline

References: Figure 2.5-12 and Table 2.5-2, Callaway Plant Unit 1 FSAR (AmerenUE, 2004)

Figure 2.5L-7—{Regional Loess Isopach Map}

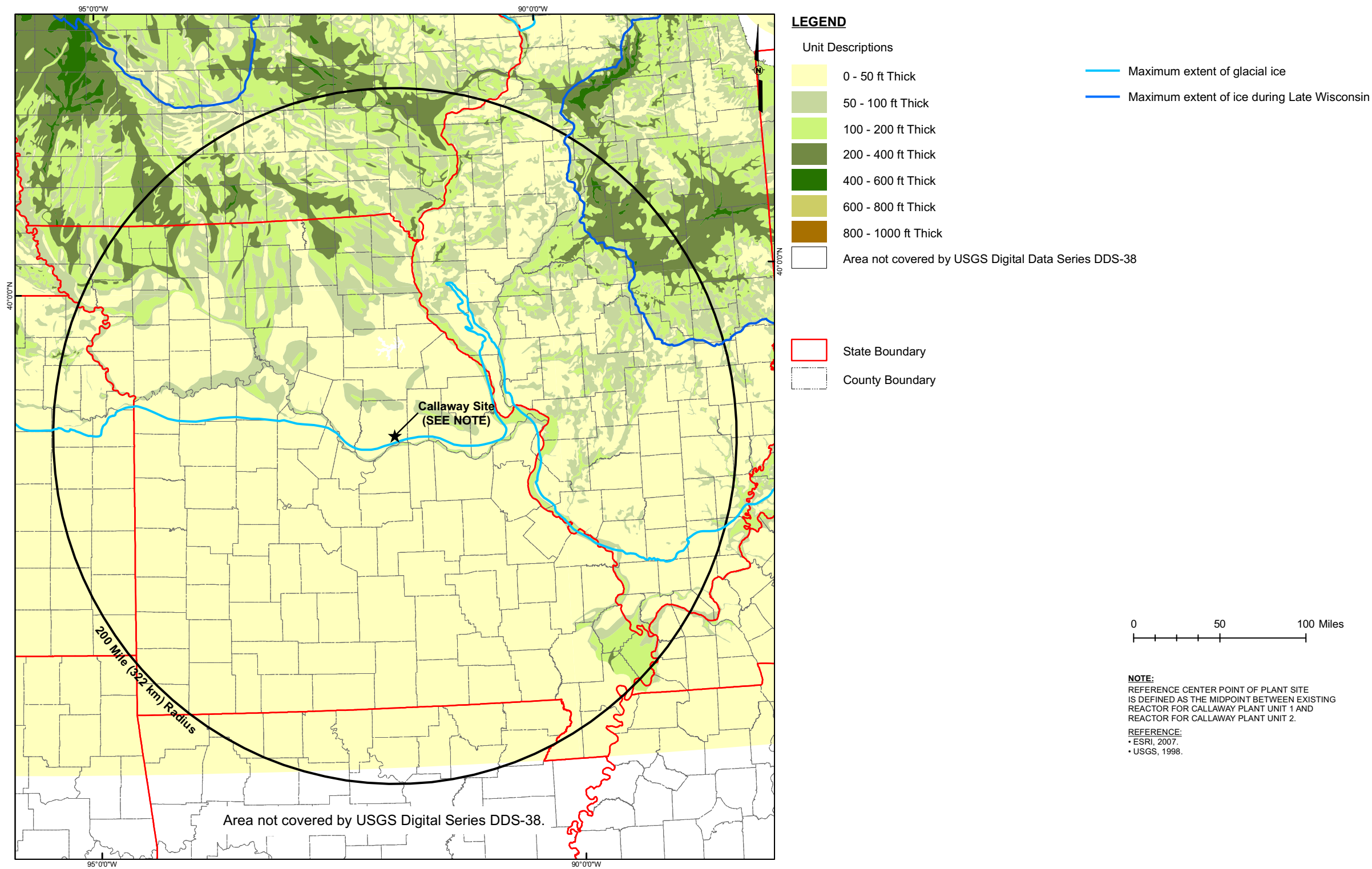


Figure 2.5L-8—{Site Vicinity Geologic Map}
25 Mile (40 km) Radius

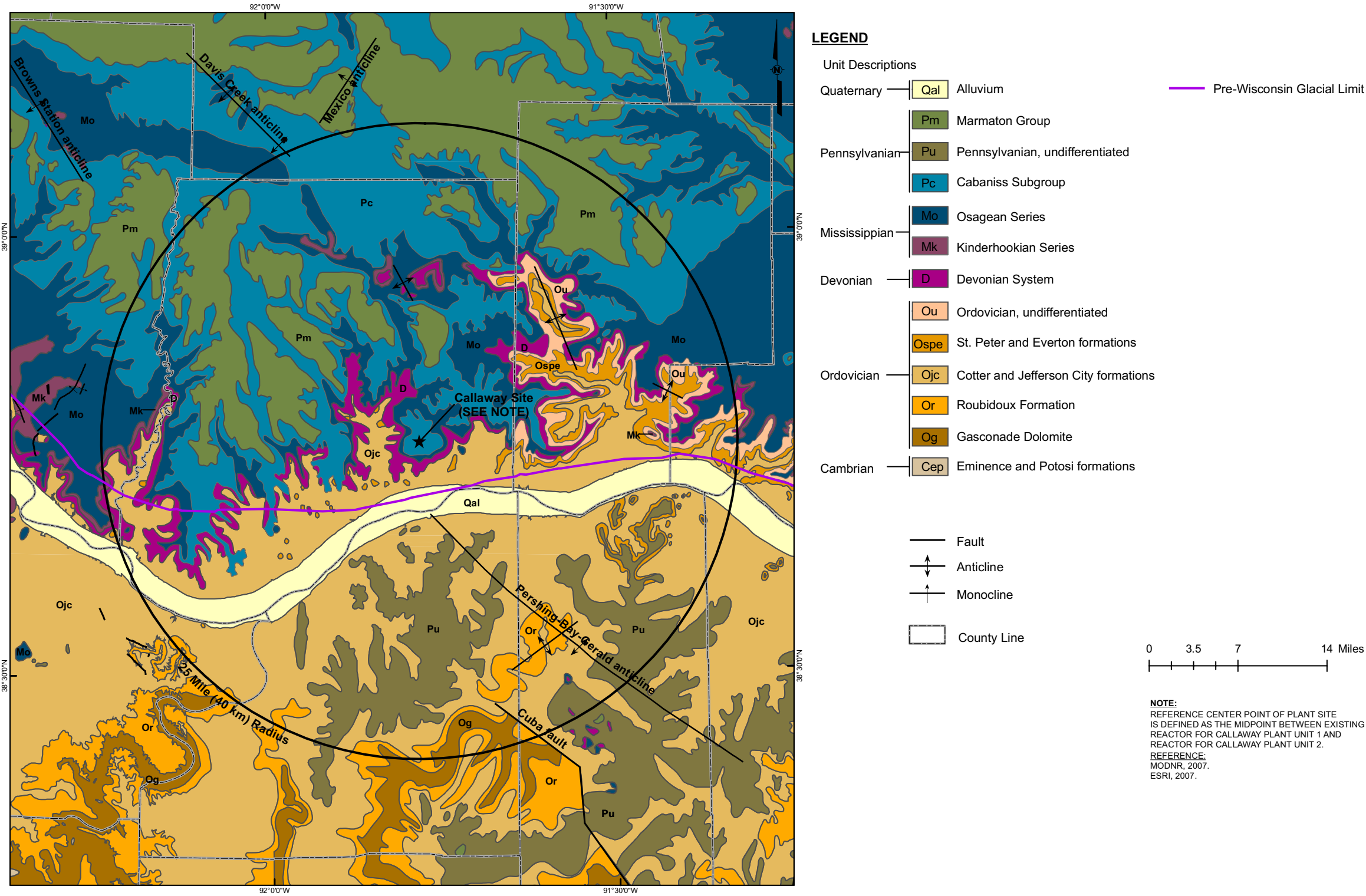


Figure 2.5L-9—{Site Area Geologic Cross Sections}

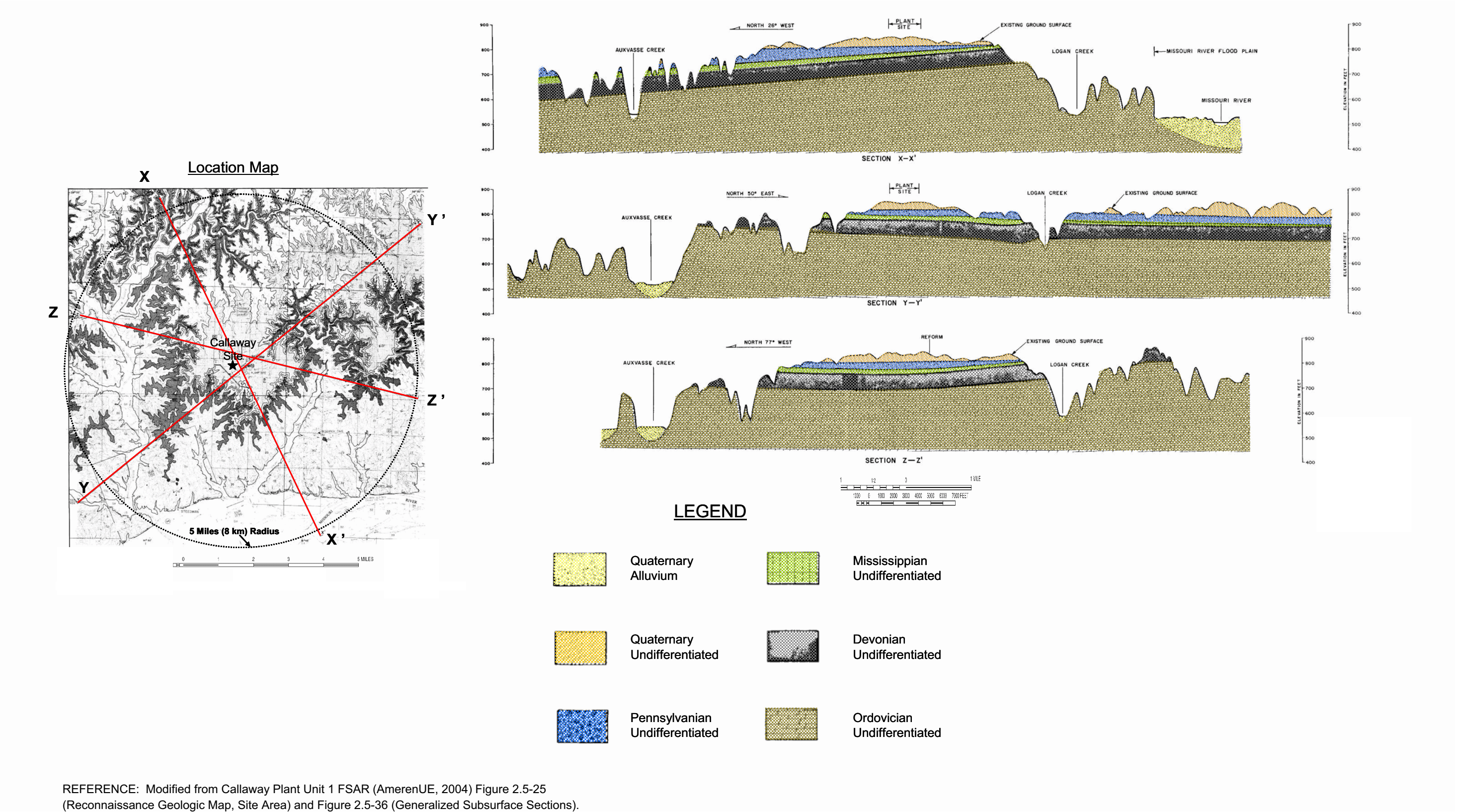


Figure 2.5L-10—{Site Geologic Cross Section}
(Sheet 1 of 5 -Boring Locations and Cross Sections)

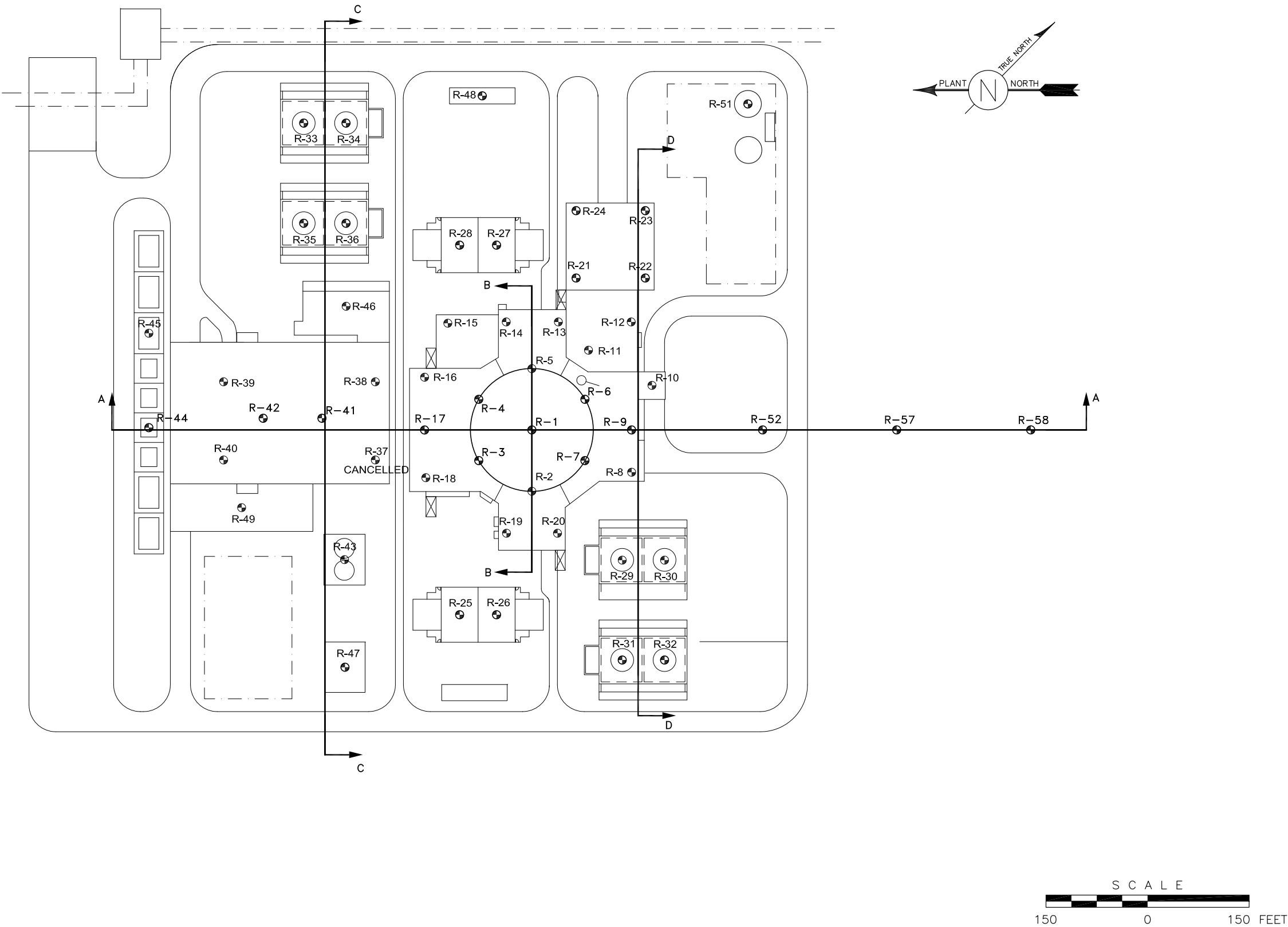


Figure 2.5L-10—{Site Geologic Cross Section}
(Sheet 2 of 5 -Section AA')

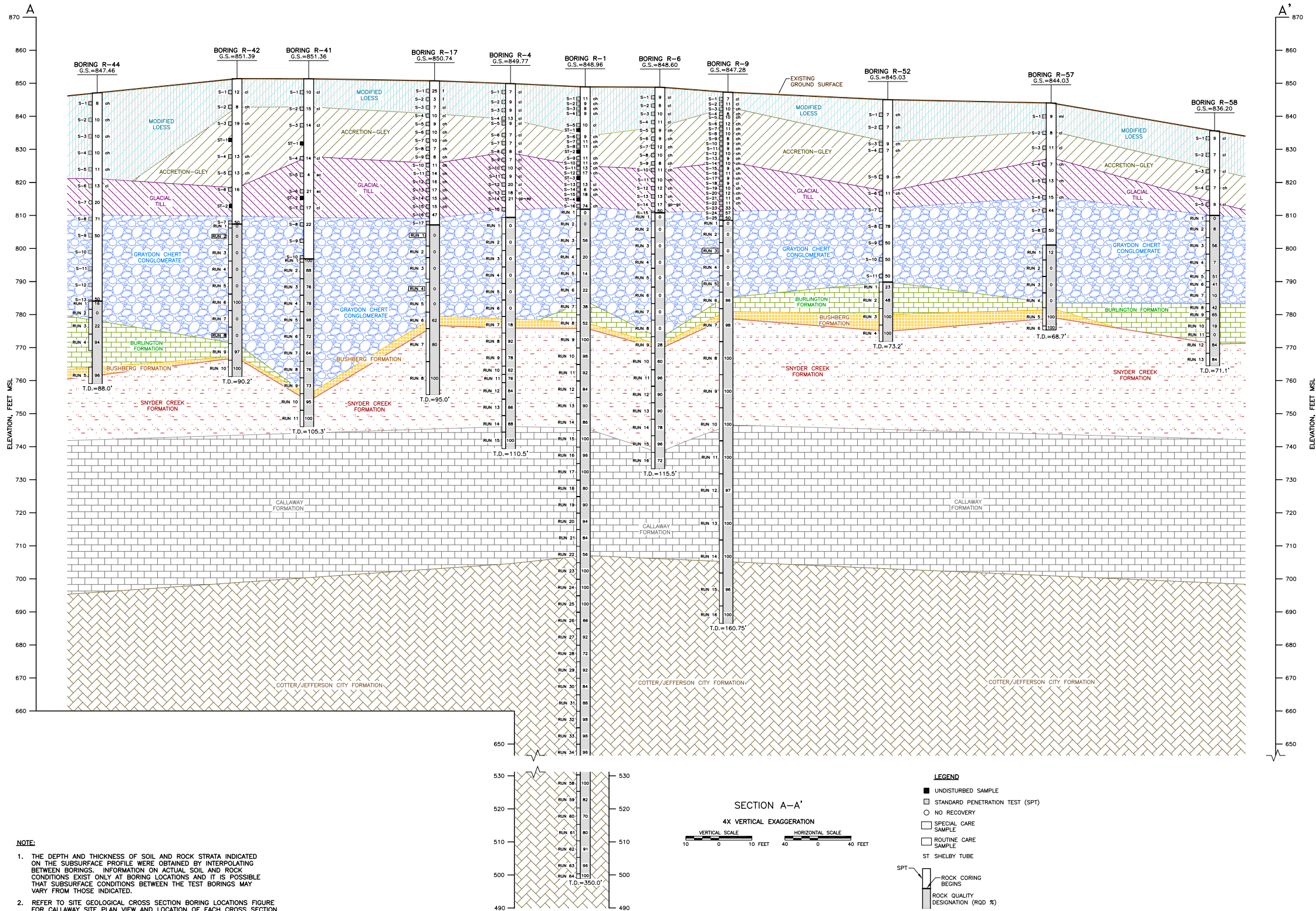


Figure 2.5L-10—{Site Geologic Cross Section}
(Sheet 3 of 5 - Section BB')

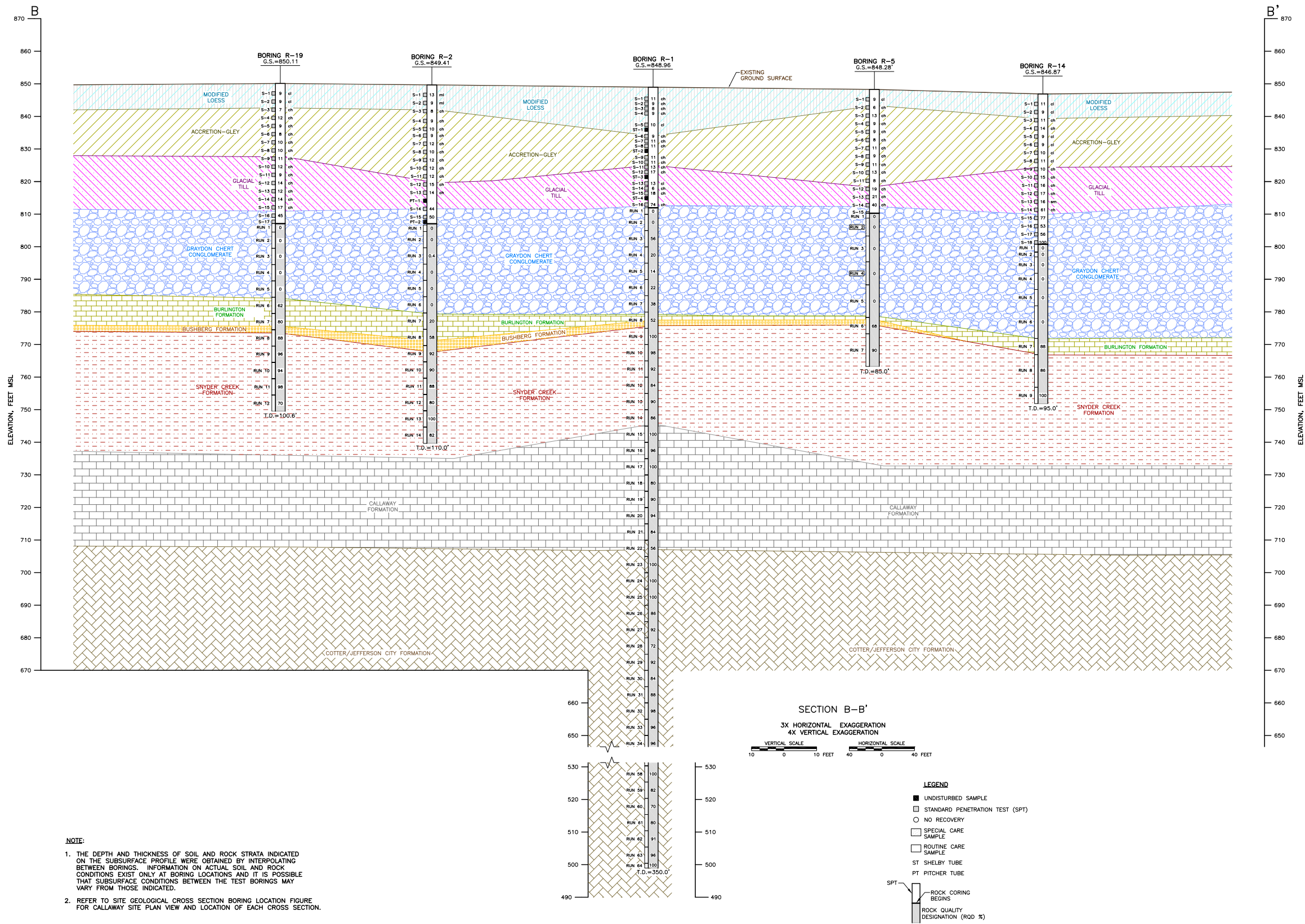


Figure 2.5L-10—{Site Geologic Cross Section}
(Sheet 4 of 5 -Section CC')

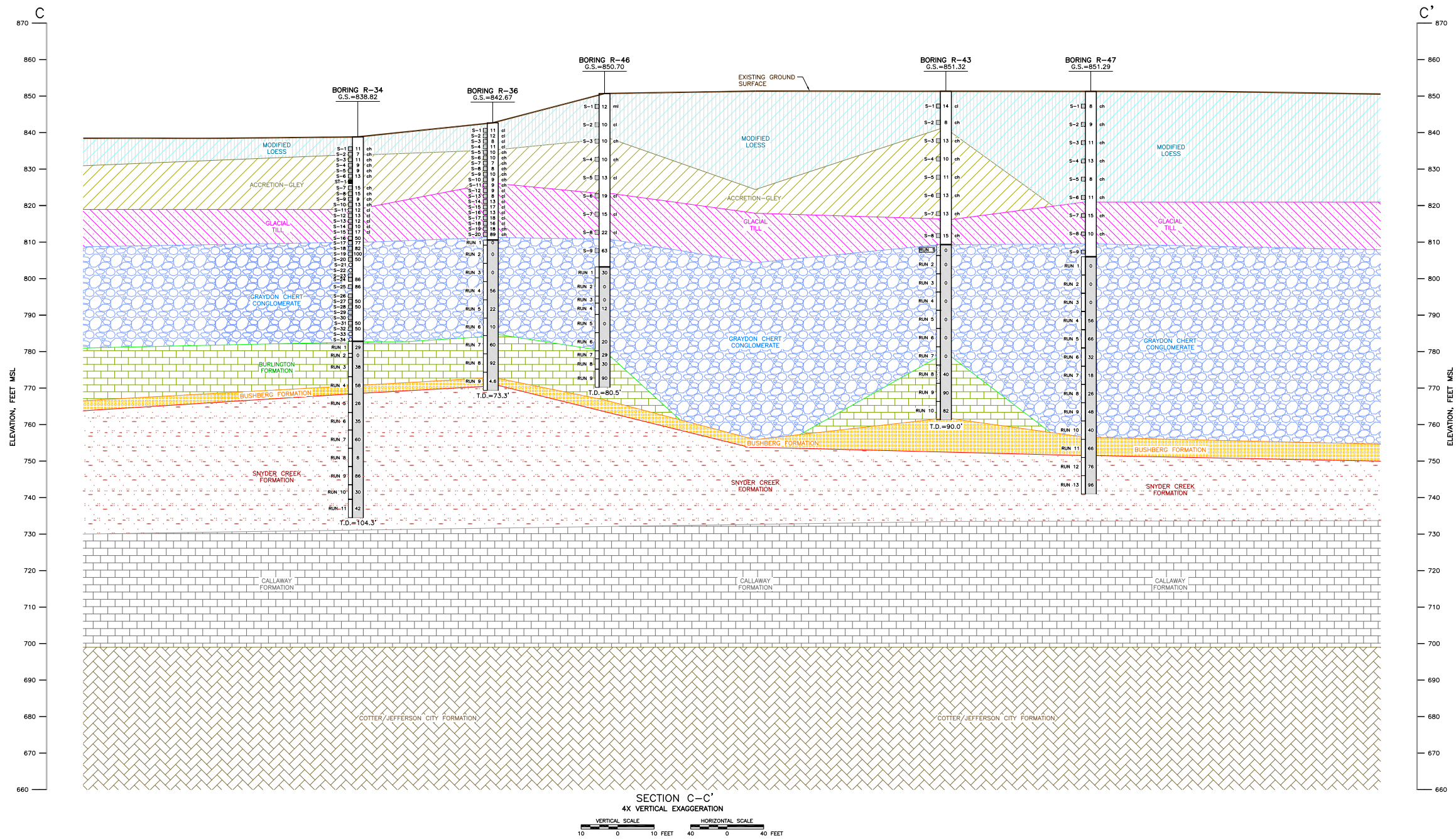


Figure 2.5L-10—{Site Geologic Cross Section}
(Sheet 5 of 5 -Section DD')

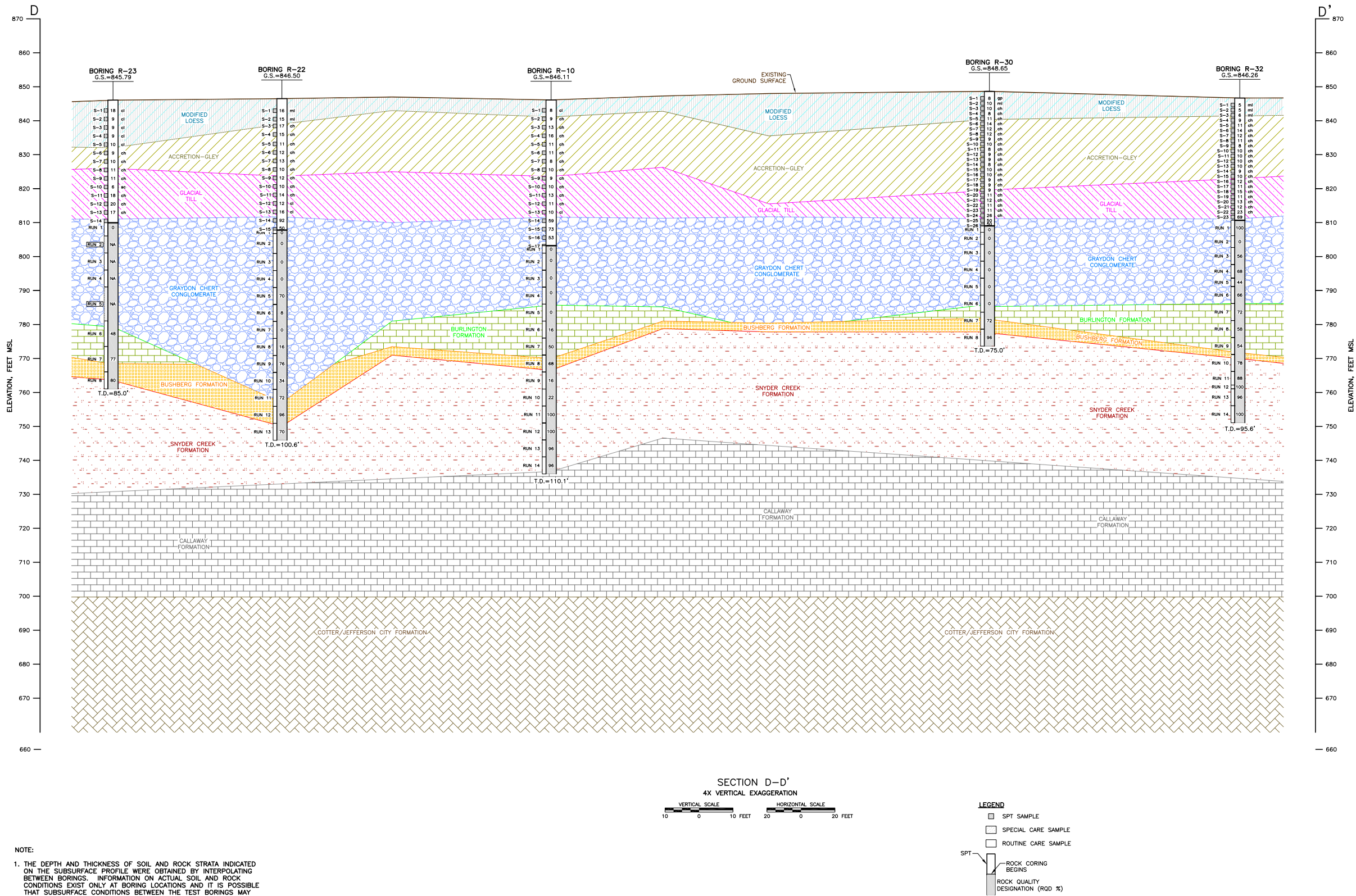


Figure 2.5L-11—{Site Grading Plan}

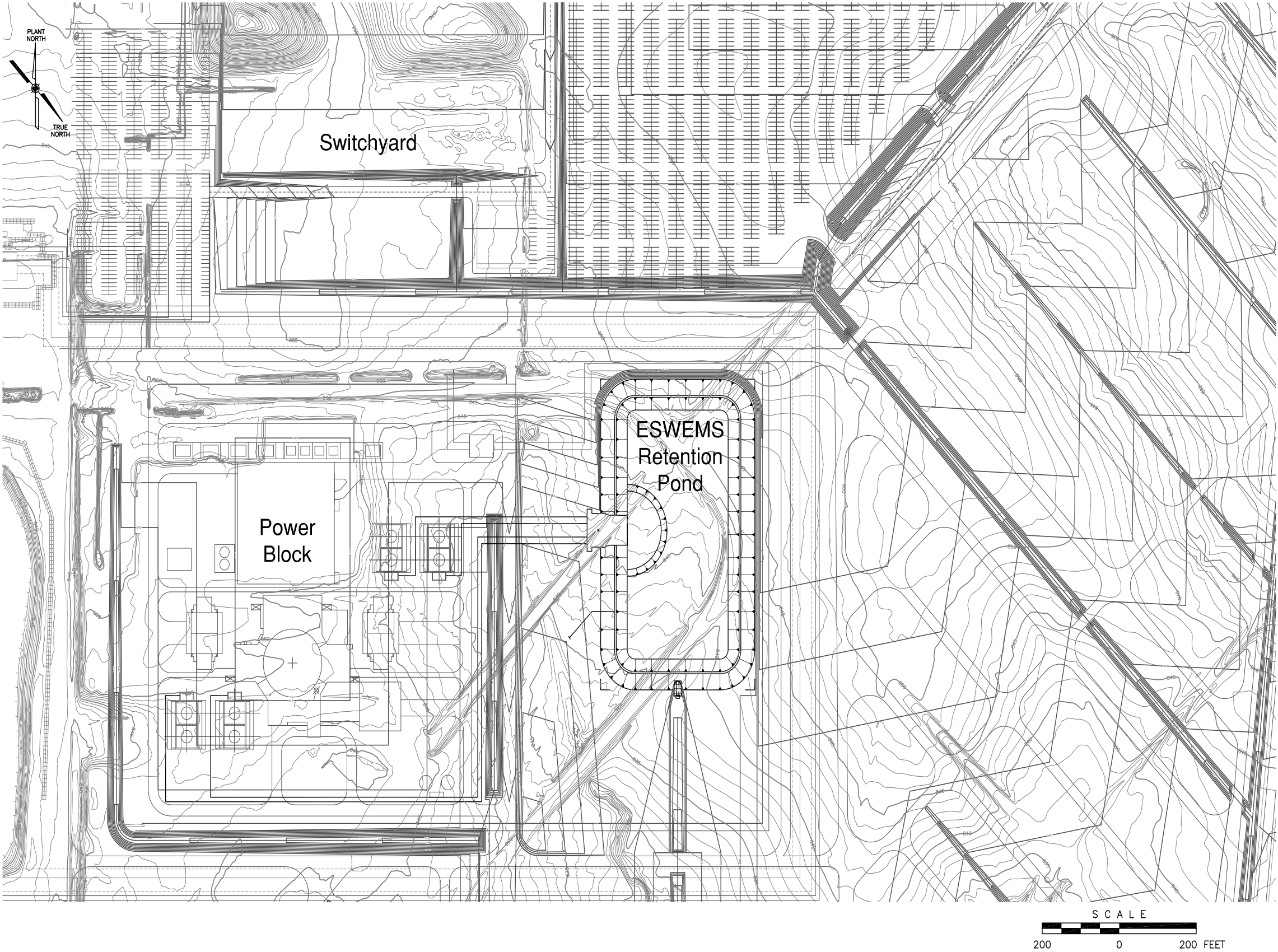
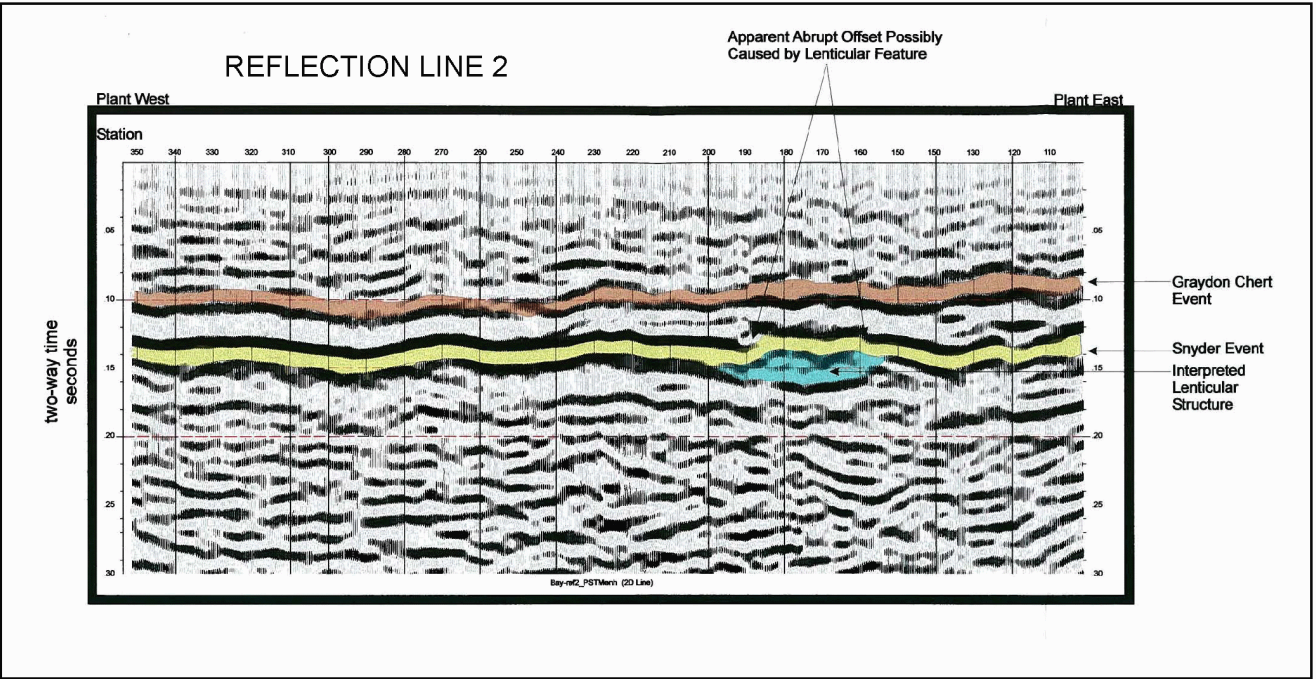
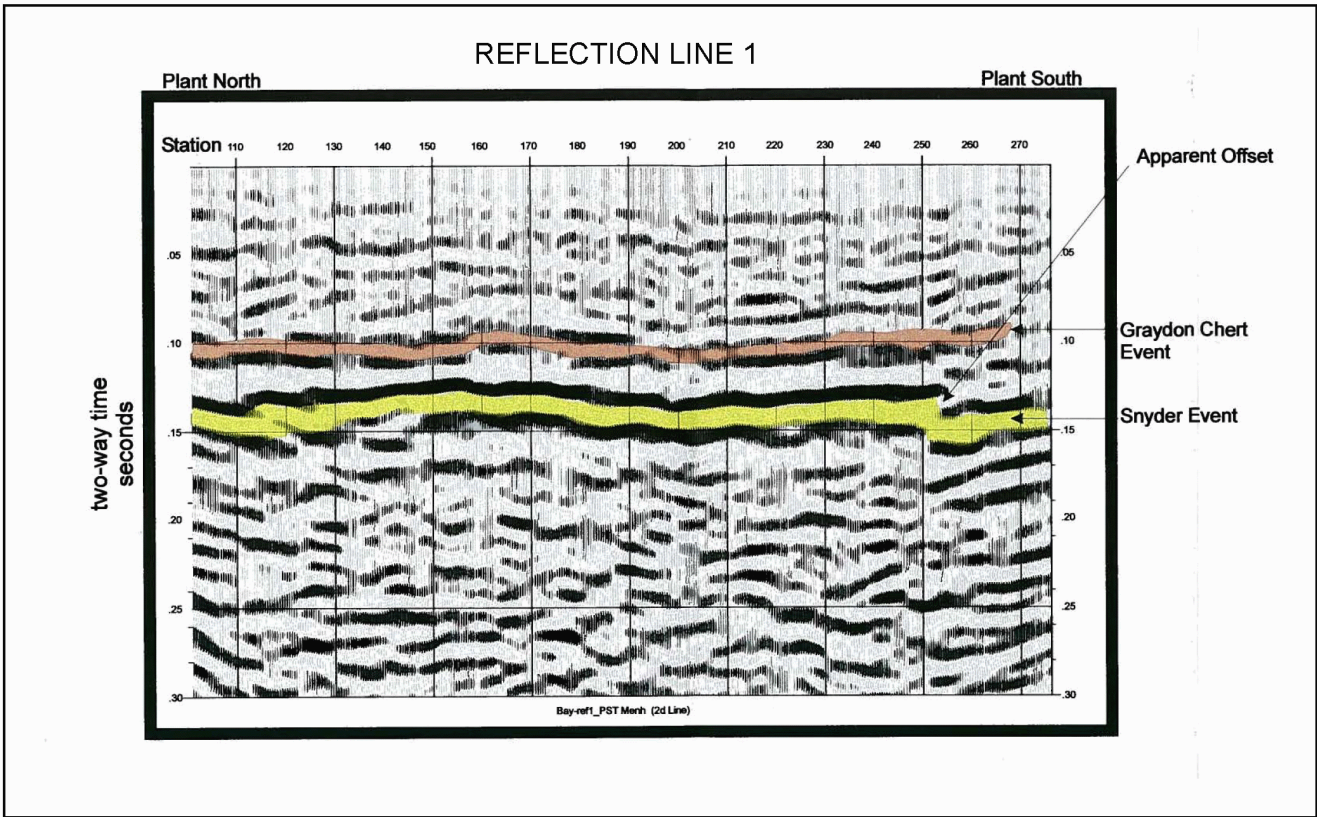
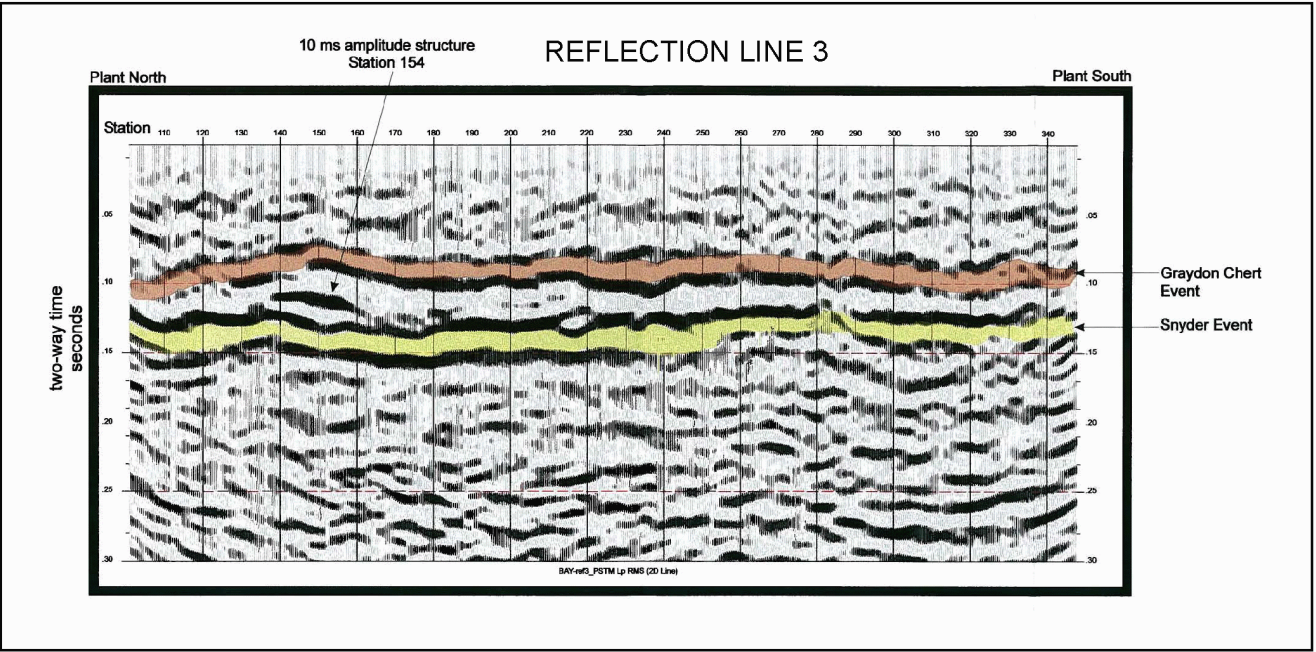
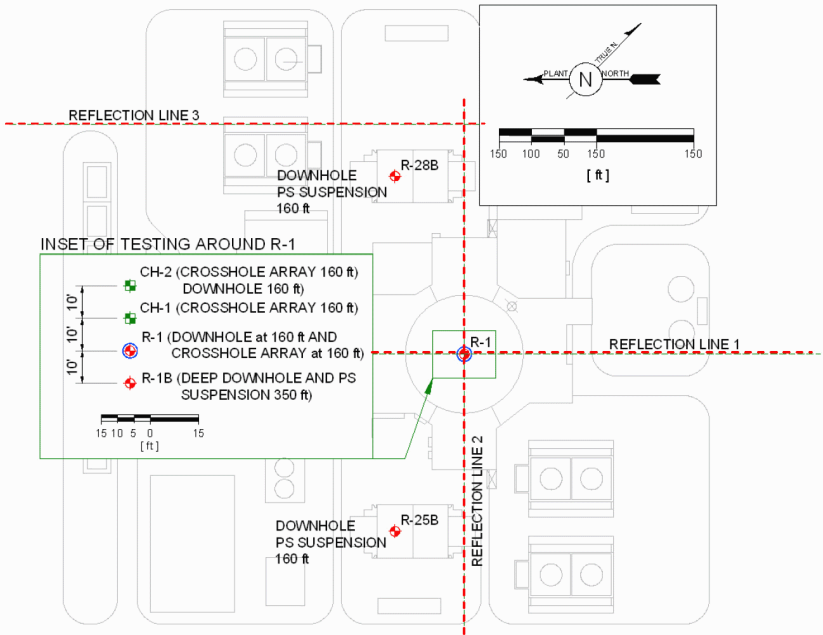


Figure 2.5L-12—{S-Wave Reflection Survey Interpretation}



Location Map



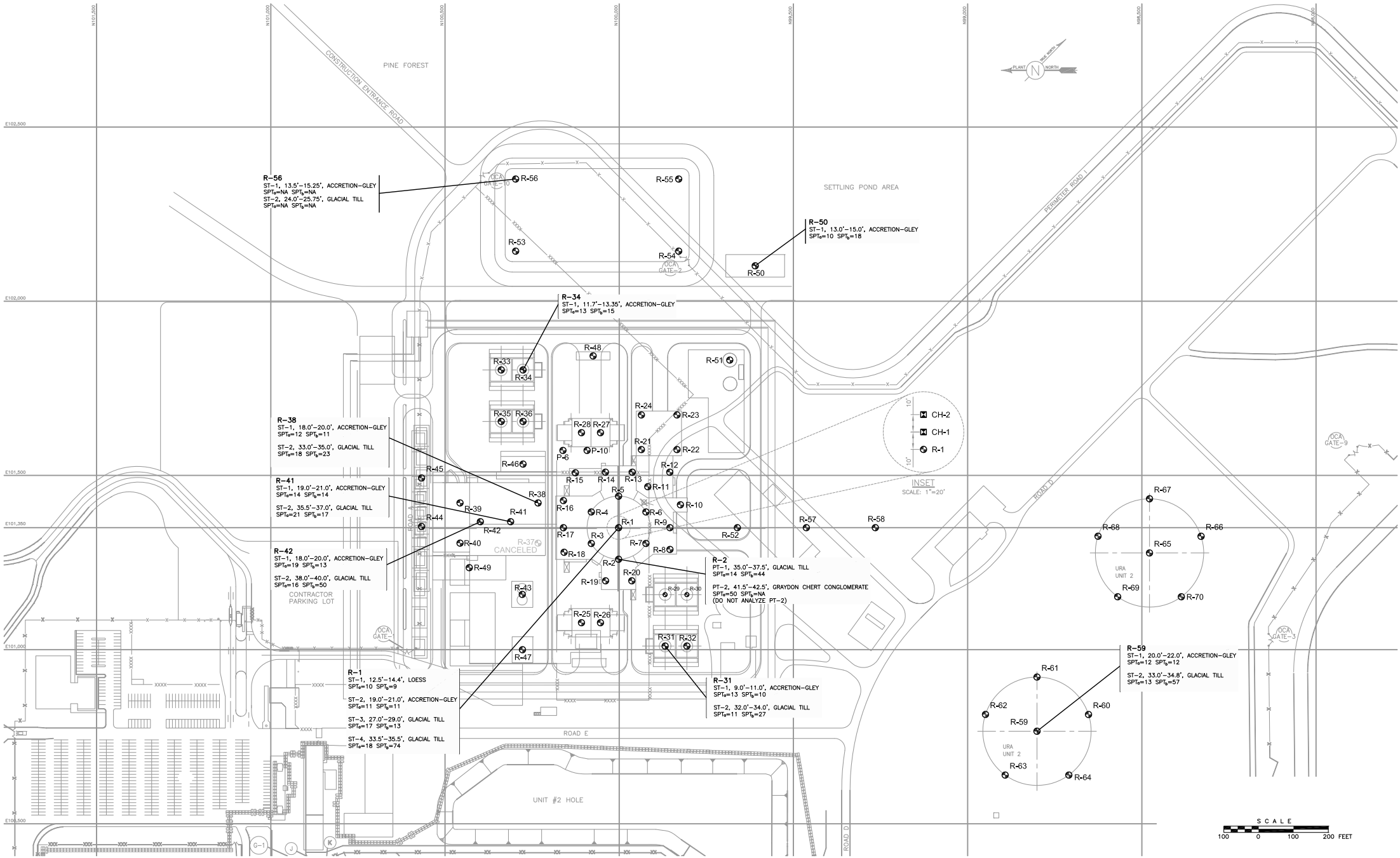
REFERENCE: Bay Geophysical, 2008.

Figure 2.5L-13—{Site Stratigraphic Column}

System	Series	Stage	Formation or Unit	Callaway Plant Unit 1 FSAR		Callaway Plant Unit 2 FSAR	
				Description	Range of Thickness (Feet)	Description	Range of Thickness (Feet)
Quaternary	Pleistocene	Wisconsinan and/or Iowan?	Loess	Wind-blown silt—altered to brown silty clay ex—Weathering.	3.0 – 15.0	Surface soil originally deposited as wind blown silt forming a loess deposit that has been altered by weathering to a mottled brown and gray, low to moderately plastic silty clay. Occasional lenses of clayey silt or silt have been encountered at the bottom of the loess.	4.5 – 22.0
		Kansan	Accretion—Gley	Gray silty clay. Moderately plastic.	4.0 – 28.0	Underlies the loess. This material is a moderately to highly plastic gray silty clay.	0.0 – 25.5
		Kansan	Glacial—Till	Reddish—brown silty clay with some sand and gravel.	3.0 – 27.0	Underlies the accretion—gley. This material consists of over—consolidated brown and mottled brown and gray silty clay containing some mixed sand and gravel and occasional lenses of silty or clayey sand.	2.5 – 21.0
Pennsylvanian	Atokan - Desmoinesian		Graydon Chert Conglomerate (Graydon Conglomerate)	Reddish—brown, blue, purple and green clay containing 20% to 65% angular to rounded, gravel to boulder size chert particles. Indurated sandstone and sandy chert conglomerate developed locally.	4.0 – 50.0	Hard clay containing irregular, angular chert fragments, sandy chert conglomerate, and local deposits of indurated, iron—stained quartz sandstone. The chert fragments vary from pebble—size to boulders nearly two feet in diameter. Locally, coarse chert conglomerate is interbedded within thin beds of ferruginous sandstone. At other exposures the deposit is composed mostly of sand and small chert fragments. No open spaces or voids are expected between fragments in this conglomerate.	11.5 – 54.8
Mississippian	Osagean		Burlington	Gray to tan limestone. Coarse grained. Cherty. Crinoidal.	0 – 42.0	Medium—to thick—bedded or massive, coarse—grained, cherty, fossiliferous limestone, composed almost entirely of crinoid columns and plates cemented by calcium carbonate. A few clay layers, less than an inch thick, which appear to be insoluble material left after solution of parts of the limestone, occur locally. This formation has an upper and lower portion. The upper is white to light gray or tan, and the lower is characteristically light tan to reddish brown. This material is expected to be discontinuous across the site allowing the very thin Bushberg Formation or thicker Snyder Creek Formation to contact the overlying Graydon Conglomerate.	0.0 – 19.7
	Kinderhookian		Bushberg	Greenish to yellowish—brown sandstone. Fine to medium grained. Friable.	0 – 8.0	Typically a medium—to fine—grained poorly sorted sandstone, most commonly watery green, but in some locations it is white or grades from white to yellowish brown. Weathered exposures are commonly dark brown to dark gray. Most of the sand is stained with ferruginous material apparently derived from weathering of included pyrite. The sandstone is composed mostly of well—rounded quartz grains. Locally the grains have been secondarily enlarged and exhibit well developed crystal faces.	0.0 – 7.0
Devonian	Upper Devonian		Snyder Creek	Brown Limestone. Silty, fossiliferous: grades downward to purple and green. Calcareous siltstone which is underlain by gray silty shale.	10.0 – 47.0	Typically a light green to yellow green calcareous shale. The upper part is characteristically a light gray to light cream highly calcareous block shale. The uppermost part of the formation in some exposures is a dense dark reddish limestone resembling the lower part of the Burlington Formation. Locally the upper beds contain thin nodular beds of light gray limestone which vary from fossiliferous to barren. The lower part is yellowish brown calcareous shale with poorly defined bedding which locally contains thin lenses of light gray argillaceous limestone. A few thin sandstone beds occur throughout the shale. Pyrite is scattered sporadically throughout the Snyder Creek but is largely altered to limonite.	22.4 – 32.2
	Middle Devonian		Callaway	Brownish—gray limestone – Fine to coarse grained. Fossiliferous. Pyrite at top, sandy at base.	11.0 – 47.0	Limestone is the dominant lithology; sandstone or sandy limestone is not uncommon in the lower beds. The limestone is commonly densely to finely crystalline, light to medium brownish gray, and weathers to light bluish gray. In many areas these beds are very fossiliferous, but in some areas they are barren. Another common lithology is a medium to finely granular (sugary) light yellowish brown limestone which forms well defined beds and generally contains many corals and stromatopora. Chert is not common but is abundant in a few exposures as dark chert nodules or chaledonic chert as large as 5 to 6 inches in length 10 feet below the top of the formation. Pyrite is common and occurs disseminated throughout the unfossiliferous portion of the formation. Shaly material is not common; where present it forms lenticular separations along bedding planes. In many places the basal Callaway is a white to light brown friable calcareous sandstone from a few inches thick to as much as 5 feet thick. Where the sandstone is absent the basal limestone is sandy.	31.3 – 41.2
Ordovician	Mohawkian		Joachim	Brown dolomite. Silty calcitic, sandy at base.	0 – 10	Not found	0.0 – 0.0
			St. Peter	White sandstone, fine grained, massive to cross bedded, friable weathers to brown.	0 – 100.0	Not found	0.0 – 0.0
			Paleokarst Rubble	Dolomite, sandstone, siltstone, and shale; disoriented. Recemented.	0 – 36.0	Not found	0.0 – 0.0
	Canadian		Cotter – Jefferson City	Light gray dolomite – fine to medium grained. Thin bedded. Numerous green shale stringers in zones. Gray banded chert.	830 – 900	Predominantly a dolomite, but contains small amounts of chert, shale and sandstone, with lateral gradation in lithologies.	210 – 295
			Roubidoux	Predominantly a quartzose sandstone in central Missouri. Some dolomitic sandstone and cherty dolomite.		Comprises sandstone, sandy dolomite, dolomite, chert, sandy chert, and cherty dolomite. Well developed sandstone beds are present, but occur at different levels in different regions of the state.	150 – 170
			Gasconade	Light brownish—gray dolomite – cherty. Coarsely crystalline near base, fine crystalline upper 1/2.		Predominantly light—brownish—gray to brown, medium to coarsely to finely crystalline dolomite, and cherty dolomite.	95 – 170
Cambrian	Upper Cambrian		Gunter Member	Sandstone – Medium grained. Quartzose.		Sandstone or sandy dolomite.	225 – 310
			Eminence	Light gray dolomite – Medium to massively bedded. Medium to coarse grained. Some chert in upper 1/2. Large chert boulders locally. Fossiliferous.	700 – 860	Sandy dolomite abundantly supplied with chert, which may suggest a clearing and warming of the sea. The existence of sand suggests the possible uprising of an area to the west or north, which exposed to older, clean sandstones. Many of the boulder like masses of chert seem to have been formed as algal masses.	15 – 30
			Potosi	Fine grained dolomite. Massive to thickly bedded. Abundant quartz druse.		Thick bedded, fine grained dolomite and it contains an abundance of small quartz crystals among red clay. In several localities, this formation has been the source of Missouri's barite.	90 – 235
			Derby—Doe Run	Thin to medium bedded dolomite alternating with thin bedded siltstone and shale.		This formation is composed of dolomite layers that total about 150 feet. The lower of these layers are sandy; they then grade upward into thin—to—medium bedded dolomite interbedded with siltstones and shale. These beds are mostly tan to brown in color.	45 – 175
			Davis	Interbedded siltstone, shale, sandstone, and dolomite. Fossiliferous near top.		Alternating thin limestones and shales with presence of a green material called glauconite, composed of iron and silica; also presents some beds composed of flat dislike pebbles of limestone with rounded edges. These pebbles may have originated as polygon like bits of limy mud formed among the cracks of mud flats exposed to temporary drying.	135 – 325
			Bonnetterre	Light gray dolomite – fine to medium grained. Locally pure. Medium bedded.		Gray limestone and dolomite. This rock is mostly fine grained and shaly but has some coarse zones. In areas where the igneous rock knobs or peaks were high enough to be out of the water during the earlier sea encroachment, these later beds lie directly upon the igneous rocks and contain sandy layers with some coarse fragments of the igneous rocks. In its exposed area, it is about 400 feet thick but has been found in drill holes to be over 1,500 feet.	155 – 170
Pre-Cambrian			Lamotte	Pink sandstone – fine to coarse grained. Cross bedded.	160 – 300	Sandstone conglomerate composed mostly of quartz and feldspar grains with a mixture of larger fragments of the glassy igneous bottom rocks.	295 – 330
				Granite rocks – some intrusive or metamorphic rocks possible.	?	Granite and rhyolite porphyry. Due to variations among the different parts of the magma, the result was a mass of igneous rocks of varying colors, some light to dark gray, some pink to red.	130 – 385
							?

REFERENCE:
— Modified from Figure 2.5–29 in Callaway Plant Unit 1 FSAR (AmerenUE, 2004).
— Gentile, 2004.
— MODNR, 2007.
— Thompson, 1986, 1991, and 1993.

Figure 2.5L-14—{Location of Undisturbed Samples}



NOTE:
1. REFERENCE TO BASE MAP

LEGEND
PT PITCHER TUBE
ST SHELBY TUBE
SPT_N N-VALUE ABOVE ST SAMPLE
SPT_B N-VALUE BELOW ST SAMPLE
NA NONE AVAILABLE

063624M10

Figure 2.5L-15—{Location of Special Care Samples}

