

Late Wisconsinan - Recent Geology of the  
Lower Rondout Valley, Ulster County, Southeastern New York

Russell H. Waines

Department of Geological Sciences

State University of New York College at New Paltz

Lower Rondout Creek extends eleven miles northeast from High Falls through Rosendale to the Hudson River at Kingston, New York. In this distance it drops from an elevation of about 120 feet at High Falls to sea level at Kingston. From High Falls to Rosendale the stream represents an easterly departure of the northeasterly-flowing Rondout Creek from its ancestral (preglacial) valley northwest of the Shawangunk Mountains. Maximum bedrock depths in the central Rondout Valley are considerably lower than the level of High Falls (Frimpter, 1970). A northeasterly retreating ice lobe in the central Rondout Valley with attendant proglacial impoundments and sedimentation at ever decreasing elevations controlled a final base level at about 400 feet.

At this point the ice lobe in the Wallkill Valley had begun to melt in such a way that the 400 foot level could not be maintained in the central Rondout Valley and base level was lowered to 250 feet or less. In the lower Wallkill (now lower Rondout) most sand deposits occur below 260 feet. The deflected Rondout now flowed into the northern (lower) portion of the ancestral Wallkill Valley bringing with it considerable sands and silts and some gravels as it cut headward in the central Rondout Valley cannibalizing proglacial sediments previously formed at higher elevations. The ultimate effect may have been the deposition of "wall-to-wall" sand in the lower Rondout Valley.

There is some question as to whether the interlaminated (varved) clays and silts of the lower Rondout Valley are contemporaneous in part with the sands which generally overlie them. The clay beds appear to have formed in front of ice, beside ice or under floating ice. The variation in elevation of the clay-sand contact, the absence of clay from some parts of the lower Rondout Valley and the general absence of interbedded clays, silts, and sands suggest the clays were formed before the sands and were even partly eroded before the sands were deposited. This would require considerable fluctuation of base level, largely controlled by the disposition of the ice lobe in the Hudson Valley, especially opposite Kingston.

In any event the sands seem to have been deposited under fluvial conditions with an ascending base level. The maximum elevation of 250 feet seems to have been controlled by spillage into the Hudson Valley through The Hell opposite Ulster Park (fig. 1). Soils maps suggest a dissected delta at the foot (east side) of The Hell.

After some evidence of a local glacier readvance over the sandplain at Maple Hill (Connally, 1968) and the development of possible small dunes at Tillson and Maple Hill the ice on the uplands on the north side of lower Rondout Creek appears to have stagnated. The ice lobe in the Hudson Valley seems to have withdrawn little by little, lowering base level in successive stages. In response to this, Rondout Creek seems to have begun headward erosion into sands and clays and eventually the production of paired and unpaired terraces at at least six different levels (Irving, 1972).

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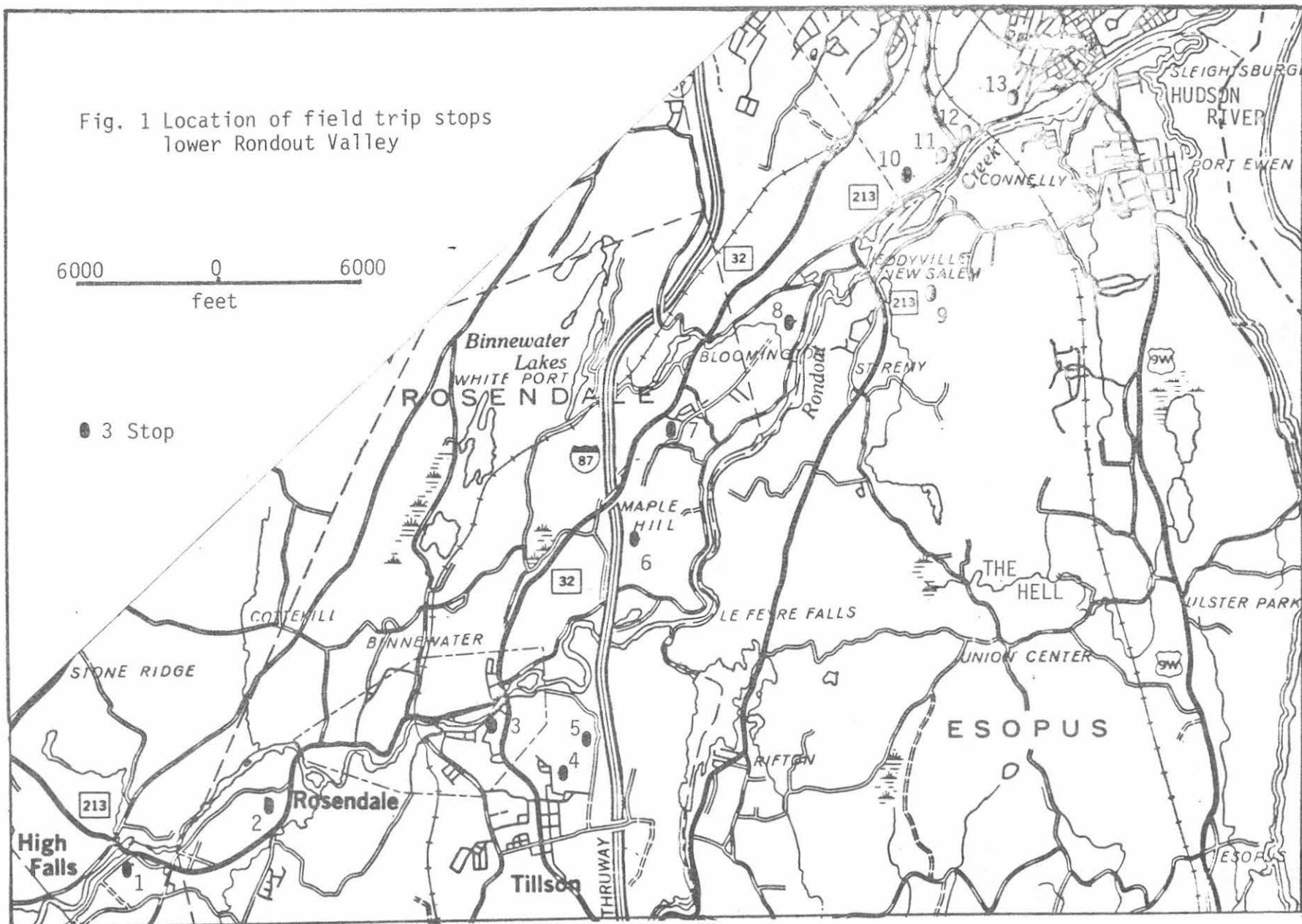
#### MAP REFERENCES

Topographic: U. S. Geol. Survey, 7½ Minute Series: Scale 1:24,000

<u>Name</u>	<u>Edition</u>	<u>Contour Interval</u>
Hyde Park, N. Y.	1963	10'
Kingston East, N. Y.	1963	10'
Kingston West, N. Y.	1964	20'
Mohonk, N. Y.	1964	20'
Rosendale, N. Y.	1964	20'

Soils: Soils maps of Ulster County portions of the above quadrangles are available through the Ulster County Planning Board. They have been prepared by the Board on New York State Department of Transport base maps and are based on a soil survey of Ulster County by the Soil Conservation Service of the U. S. Department of Agriculture.

Fig. 1 Location of field trip stops  
lower Rondout Valley



## ROAD LOG - FIELD TRIP B-13

Mileage	Cumulative Mileage	
----	-----	Leave R.P.I. grounds and proceed by N.Y. 2 and 7 across bridge over Hudson River to Expressway 787. Proceed south to N.Y. State Thruway then south to Kingston, N.Y. Mileage begins at toll booth of Thruway exit.
0.0	0.0	Toll booth, Exit 19, New York State Thruway, Kingston, New York. Bear right into traffic circle and bear right onto N.Y. 28 heading west.
0.3	0.3	Bridge over New York State Thruway
0.1	0.4	Traffic lights.
0.2	0.6	Bridge over US 209. Bear right immediately after bridge onto offramp circling to US 209 and Ellenville.
0.25	0.85	Bear right onto US 209 and pass under NY 28 bridge heading south on US 209 across Esopus Creek floodplain.
1.25	2.1	Bridge over Esopus Creek.
3.6	5.7	Esopus Creek and floodplain on right.
3.7	9.4	Veer left onto Leggette Road in Stone Ridge. The Bank on near left.
0.25	9.65	Divide between present day Esopus and Rondout drainage systems ca. 400 feet.
0.3	9.95	400 foot sandplain, somewhat dissected and possibly terraced for next 0.4 miles.
0.4	10.35	Road descendsthrough cut in sandplain for 0.15 miles.
0.8	11.15	Yield. Turn right onto Lucas Ave.
0.1	11.25	250 foot sandplain.
0.2	11.45	Stop. Turn left onto NY 213.
0.1	11.55	Bridge over Rondout Creek.
0.05	11.6	Berne Rd. on right. Park where possible. Continue on NY 213 after Stop.
<p><u>STOP NO. 1 - High Falls.</u> When blocked to the north while at a 400 foot base level Rondout Creek apparently found an outlet eastward into, under or around ice in the lower Wallkill drainage system. The river later established a base level at 250 ft. and subsequently has cut down to approximately 170 feet, the present level of bedrock (late Silurian Rondout Formation) at the top of the falls. The 250 foot sandplain can be seen to the north.</p>		
0.25	11.85	Village of High Falls, Delaware and Hudson Canal, Locks and Museum.
0.25	12.1	Enter Town(ship) of Rosendale.
0.2	12.3	Hairpin turn left off NY 213 onto Old NY 213 just as approaching 210 foot sandplain terrace.
0.2	12.5	Road veers left but continue straight on Old NY 213.
0.1	12.6	Stop. Turn right on Bruceville Rd. Rondout Creek on left.
0.95	13.55	Park on right side of road. Continue on Bruceville Rd. after Stop.

STOP NO. 2 - Hurley Sand and Gravel Co., Inc. Sand and gravel pit. This extensive pit has been developed in the 210 foot sandplain terrace. Remnants of the original 250 foot sandplain occur locally. Although stratigraphic exposures are poor, several large piles of coarse water-worn gravels remaining from sieving

operations attest to the considerable gravel content of the sands. About 50 feet of gravels and sands fine downward to silts which in turn are underlain by clays. No where else in the lower Rondout Valley are gravels so abundant in the upper sands.

0.15	13.7	Till on hillside to left.
0.05	13.75	Stop. 90 foot floodplain ahead. Turn left onto NY 213.
0.2	13.95	Bridge over Rondout Creek.
1.3	15.25	Turn right and cross bridge over Rondout Creek. Village of Rosendale.
0.1	15.35	Keep left on James St. and continue on sloping sandplain terrace ca. 100 foot level.
0.35	15.7	Descend to 50 foot floodplain and/or terrace.
0.1	15.8	Pull over to right. Do not block driveway. Continue on James St. after Stop.

STOP NO. 3 - Rondout Creek, Rosendale. This floodplain and/or terrace was flooded in the summer and fall of 1955. Buildings on the north side of the river were flooded to the middle of their second stories. Part of the Army Corps of Engineers' stream channelization efforts in response to the 1955 floods can be observed.

0.15	15.95	Stop. Right onto NY 32-213.
0.25	16.20	Town of Rosendale Recreation Center on 70 foot terrace on right. Ascend through sands to sandplain level.
0.65	16.85	250 foot sandplain for next 0.35 miles. Village of Tillson.
0.35	17.2	Turn left onto Grist Mill Rd. at U.S. Post Office.
0.05	17.25	Turn left onto Hardenburg Ave. Drive north up the gentle slope of the 250 foot sandplain.
0.3	17.55	Four-way stop. Jog left and continue north on Hardenburg Ave.
0.1	17.65	Entering region of low sand hills on 250 foot sandplain. Swing right (east).
0.05	17.7	Stop. Turn left onto Mt. View.
0.1	17.8	Pull over to right. Continue north after Stop.

STOP NO. 4 - Tillson sand hills. Low sand hills rise 10 to 15 feet above the 250 foot sandplain along the southern margin of the Rondout Valley in the vicinity of Tillson. Inspection of a trench in the flank of one sand hill revealed a structureless non-stratified fine sand to silt. The hills are here thought to represent small sand dunes formed on the 250 foot sandplain just in advance of an ice front in the uplands on the north side of the Rondout Valley.

0.05	17.85	Turn left.
0.05	17.9	Turn right over sand hill onto Carroll St.
0.05	17.95	Turn left onto Spring St.
0.25	18.2	Stop. Turn right (south) onto Mt. View.
0.1	18.3	Swing left (east).
0.1	18.4	Stop. Turn left.
0.05	18.45	Swing right leaving sand hill area.
0.05	18.5	Stop. Continue straight (east) on Grove St.
0.15	18.65	Stop. Turn left (north) on Bloomingdale Road.
0.15	18.8	Sand hills to left (west) behind houses.

0.2 19.0 Park on left where possible. Continue north on Bloomingdale Rd. after Stop.

STOP NO. 5 - Sand pit in 250 foot sandplain. Almost the entire uppermost 110 feet of section is exposed with varying degrees of perfection. This is a shovel-stop. Sands fine downward into silts which overlies interlaminated (varved) clays and silts at about the 150 foot elevation. Extensive slump structures have been observed in the silts about 20 to 30 feet above the silt-clay interface. Gravels in the sands are fine and very infrequent. Current bedding, current and climbing ripples have been noted in the sands where bedding is generally thin to laminar.

0.1 19.1 Descend cut in sands.

0.2 19.3 Bear left.

0.2 19.5 Bear left.

0.2 19.7 50 foot terrace and sometime floodplain. Modern floodplain at 40 feet along south side of Rondout Creek.

0.2 19.9 Flood control dike on right.

0.15 20.05 Stop. Turn right (north) on NY 32-213.

0.05 20.1 Bridge over Rondout Creek.

1.85 21.95 Bridge over N. Y. State Thruway.

0.05 22.0 Turn right onto Alberts Ave. immediately after bridge.

0.35 22.35 Park on right. Return on Alberts Ave. after Stop.

STOP NO. 6 - Maple Hill sand pit in 250 foot sandplain. Here in an 80 foot sequence sands grade downward into silts which overlies interlaminated (varved) clays and silts at an elevation of about 160 feet. Little can be seen presently of the structure in the sands and silts. This pit was investigated as a potential sanitary landfill site but a high water table and water-saturated silts above the clays preclude its use for that purpose. A few low sand hills occur in the wooded area northeast of the pit. Of some interest is the till-like material overlying the sandplain near the pit entrance and elsewhere. Sieve analysis has yielded a polymodal distribution of particle sizes. This material is one line of evidence for the Rosendale Readvance of Connally (1968). Several samples of split-spoon core obtained in test-borings in the pit will be displayed.

0.35 22.7 Stop. Turn right(north) on NY 32.

0.7 23.4 Turn right onto Taylor St.

0.05 23.45 Bloomington Fire Company. Park but keep clear of fire house. Continue of Taylor St. after Stop.

STOP NO. 7 - Bloomington sandplain 190 foot terrace. Local borings, some over 100 feet to bedrock, have encountered an almost total sand-silt sequence with little or no clay. Exposures of the upper sands may be seen in cuts southeast of the fire house.

0.1 23.55 190 foot sandplain terrace.



- 0.05 23.6 Stop. Bear left(north).
- 0.15 23.75 Stop. Turn right on Main St., pass graveyard and proceed down hill.
- 0.3 24.05 Stop. Turn right onto Creeklocks Rd.
- 0.45 24.5 Lock of Delaware and Hudson Canal on left.
- 0.25 24.75 Large glacial clasts form "boulder train" crossing Rondout Creek on left. "Fines" have been removed from glacial till by the downcutting creek leaving clasts too large to move.
- 0.1 24.85 Delaware and Hudson Canal on left.
- 0.8 25.65 Turn around at entrance to Webster Lock Rd. on left and retrace route on Creeklocks Rd.
- 1.6 27.25 Pass Main St. on left.
- 1.0 28.25 Small bridge over Greenkill Creek. Rondout Creek and modern floodplain to right. Slightly higher floodplain terrace on far side of Rondout Creek.
- 0.2 28.45 50 foot terrace to right across Rondout Creek.
- 0.1 29.55 Pull over carefully to right. Do not block traffic. Continue on Creeklocks Rd. after Stop.

STOP NO. 8 - Sand pit. Do-it-yourself stop. This pit is developed in the side of a typical sand-silt sequence rising to a 170 foot sandplain terrace. Ultimately about 130 feet of sands and silts are exposed and none of the typical interlaminated clays and silts have been encountered, even as low as the 40 foot elevation.

- 0.35 29.9 Stop. Proceed straight ahead (north) out onto Canal St.
- 0.15 30.05 On the left, the ancestral Wallkill River probably passed. On the right the Delaware and Hudson Canal descended through locks to tidewater.
- 0.2 30.25 Stop. Turn right onto NY 213.
- 0.05 30.3 Bridge over Rondout Creek.
- 0.15 30.45 Turn left onto New Salem Rd. (Salem St.).
- 0.1 30.55 Turn right on Lake View Ter.
- 0.2 30.75 Turn in dead end and park. Walk uphill on path to sand pit. Retrace route along Lake View Ter. after Stop.

STOP NO. 9 - New Salem sand pits. The sequence on the hillside from the top down is as follows: The top sands occur 170 feet above the road or at about 260 feet elevation. The sands fine downward to silts for some 90 feet and red clays start about 80 feet above the road or about 170 feet above sea level. The sequence is somewhat similar to those of Stops 5 and 6 and unlike those of Stops 7 and 8.

- 0.2 30.95 Stop. Turn left onto New Salem Rd.
- 0.1 31.05 Stop. Turn right onto NY 213.
- 0.15 31.2 Bridge over Rondout Creek.
- 0.35 31.55 Ancestral Wallkill River may pass under Show Boat on right.
- 0.5 32.05 Park on left in entrance to chained road. Continue on NY 213 (Abeel St.) after Stop.

STOP NO. 10 - City of Kingston sand and gravel pit. Foreset beds of deltaic sands and gravels rest against steep bedrock surfaces. Sands and silts in attitudes of slump appear to have been deposited over ice. High up on the hillside to the northwest glacial striations are well-developed. Some of the foreset gravels are cemented to the hillside by means of calcium carbonate.

- 0.1 32.15 Gravel pit on left.
- 0.25 32.4 Sand pit on left.
- 0.05 32.45 Pull off on left and park. Continue on NY 213 (Abeel St.) after Stop.

STOP NO. 11 - Sand pit. View stop. This pit is developed in the lower portion of a sand-silt sequence rising to a 210 foot sandplain terrace to the northwest. The exposed sediments represent the bottom 160 feet or so of a 190 foot plus sequence. To the northwest sediments have been deposited against steep bedrock surfaces. Slumped sediments in the southwest corner of the pit may have been deposited over ice.

- 0.15 32.6 Flashing light. Stay right.
- 0.1 32.7 Pull off and park on right. Walk back to Davis Ave. and look northwest up the Twaalfskill Valley and Wilbur Ave. Continue on Abeel St. after Stop.

STOP NO. 12 - Twaalfskill Valley. This narrow valley incised into Upper Silurian and Lower Devonian strata may represent an ancient drainage system from the north, possibly the ancestral Esopus. The bedrock profile in the center of the Twaalfskill Valley is not entirely known. This valley appears to have allowed passage of glacial waters and sharing of base level between the Esopus and lower Rondout Valleys. Sands at the 250 foot level extend through part of Kingston up the east side of the Esopus Valley.

- 0.15 32.85 Pass under R.R. bridge.
- 0.25 33.1 Bear left up Hudson St.
- 0.4 33.5 Turn left onto Montrepose Ave.
- 0.05 33.55 Turn left onto West Chestnut.
- 0.2 33.75 Turn at end of road and park. Follow path about 50 paces southwest. Retrace route on West Chestnut after Stop.

STOP NO. 13 - View stop, 250 foot sandplain remnant. From the road the confluence of the Hudson River and Rondout Creek can be viewed. Glacier ice in the Hudson Valley at this point influenced drainage and effective base level in the lower Rondout Valley. A second location about 50 paces southwest of the end of the road affords a view southwest up the lower Rondout Valley as far as Maple Hill. With skill various terrace levels and remnants of the 250 foot sandplain can be distinguished.

0.2	33.95	Stop. Turn left onto Montrepose Ave.
0.1	34.05	Turn right on West Chester.
0.45	34.5	Traffic light. Turn left on Broadway and proceed northwest.
1.05	35.55	Traffic light. Get into right lane and proceed straight ahead toward N.Y. State Thruway onto Col. George F. Chandler Drive.
0.65	36.2	Bridge over Esopus Creek.
0.5	36.7	Enter Kingston traffic circle. Bear right.
0.1	36.8	Bear right to N.Y. State Thruway toll booth entrance 19. Proceed north toward Albany or south toward New York City.