

U.S. Department of the Interior  
Geological Survey

Gravity base stations in the  
Hamilton and Elk City 1° x 2° quadrangles,  
Montana and Idaho

Viki Bankey and M. D. Kleinkopf

Open-File 85-115

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This report describes 9 gravity base stations set by the U.S. Geological Survey (USGS) in the Hamilton And Elk City 1° x 2° quadrangles, Montana and Idaho. Each USGS gravity base is referenced or updated to the International Gravity Standardization Net of 1971 (IGSN-71). Most of these bases were tied to one of the U.S. Department of Defense (DOD) gravity bases, although some bases were tied to secondary USGS bases previously tied to DOD bases. The DOD bases in the area include Grangeville and Missoula (updated this report). Secondary bases were tied two or more times to ensure accuracy, and the average value of these ties is used as the observed gravity value.

Many of the gravity bases are set at bench marks. Those that are not are given estimated elevations based on contours interpolation from 1:24,000 or 1:62,500 scale topographic maps. These elevations are noted by the letters "est", which signifies an estimated elevation for that gravity base station.

These base description sketches are not drawn to scale and should be used with topographic maps.

SELECTED REFERENCES

Defense Mapping Agency Aerospace Center, 1974, World Relative Gravity Reference Network, North America, Part 2: DMAAC Reference Publication 25, with supplement updating gravity values to the International Gravity Standardization Net 1971, 1635 p.

International Association of Geodesy, 1967, Geodetic Reference System, 1967, International Association of Geodesy Special Publication 3, 74 p.

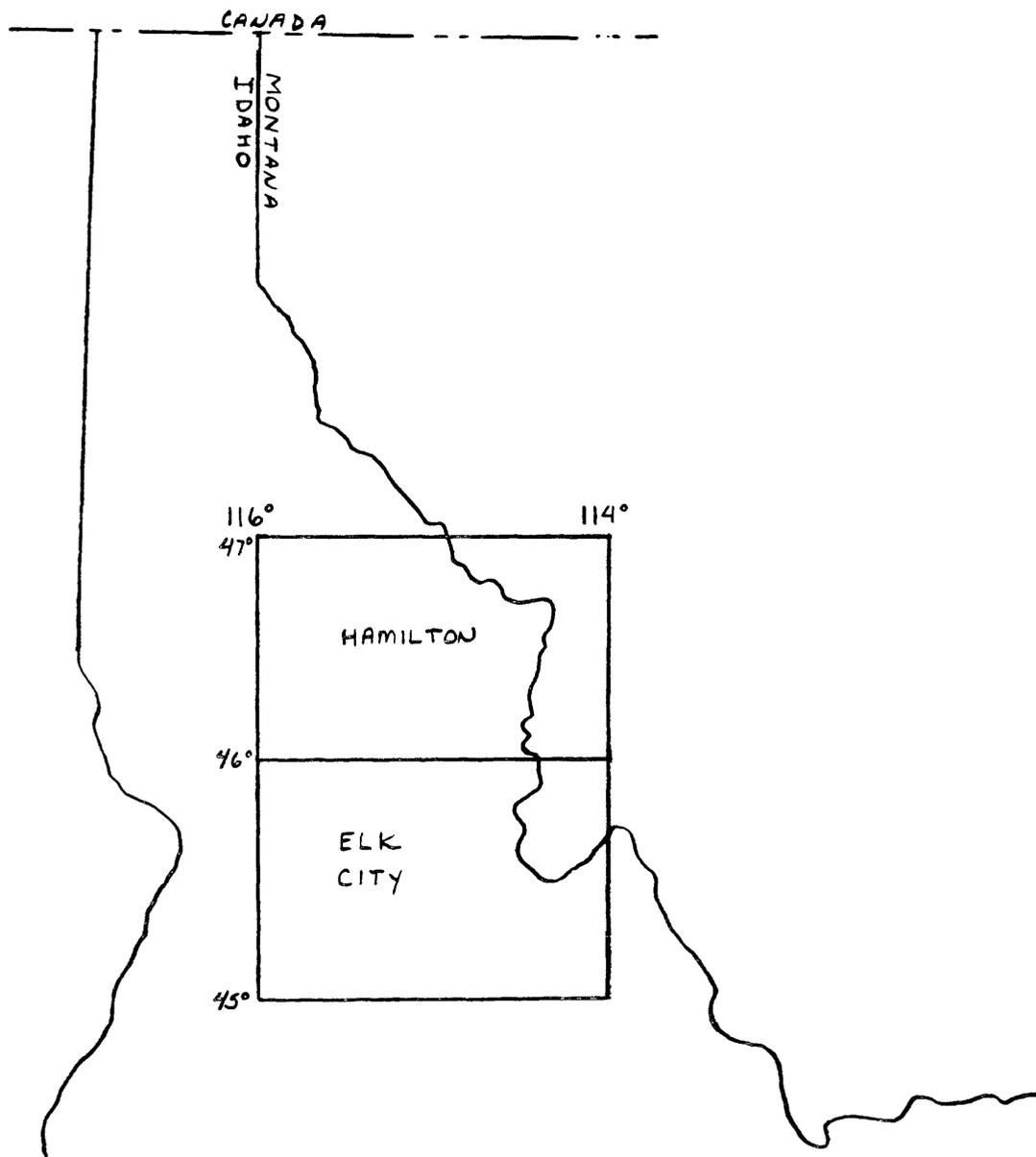


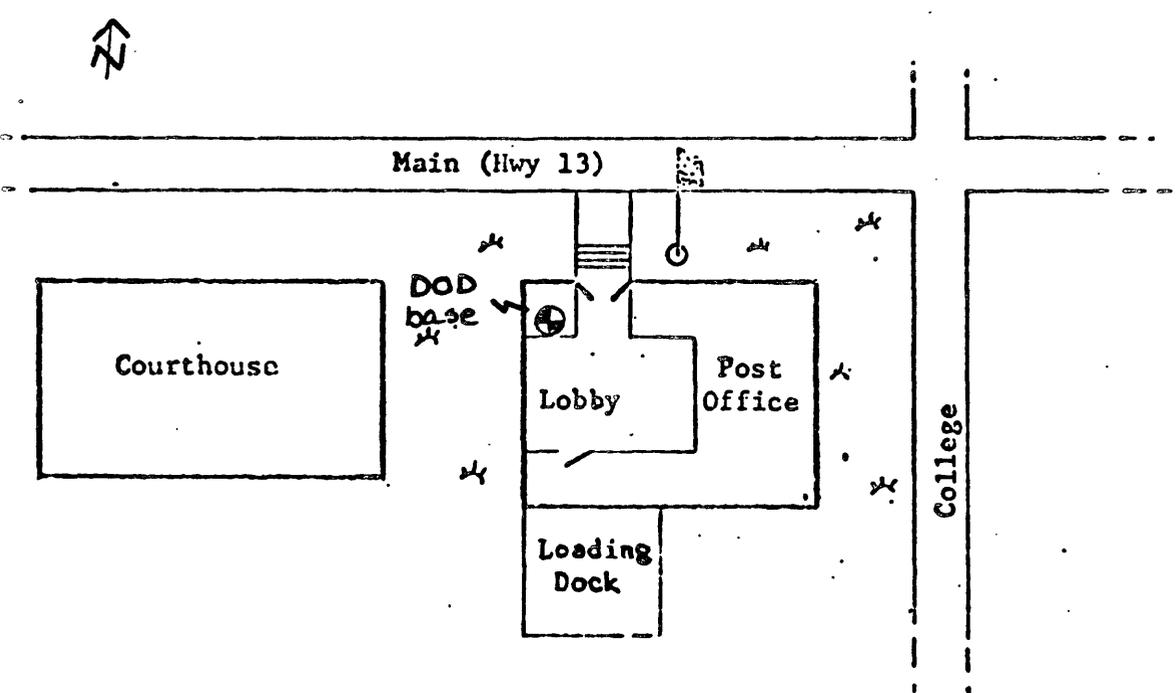
Figure 1--Location map of the Elk City and Hamilton quadrangles, Montana and Idaho.

### GRAVITY BASE STATION

LATITUDE	45° 55.57'N (1)	STATION DESIGNATION	
LONGITUDE	116° 07.30'W (1)	GRANGEVILLE DOD	
ELEVATION	1036.32 METERS (1)	COUNTRY/STATE	
		USA/Idaho	
REFERENCE CODE NUMBERS		ADOPTED GRAVITY VALUE	
ACIC 3936-2		g = 980 382.52	mgals
IGB 15656B			
		ESTIMATED ACCURACY	DATE
		± 0.1 mgals	MONTH/YEAR
			10/73

**DESCRIPTION AND/OR SKETCH**

Base is located in Grangeville, ID., at the US Post Office, inside the main entrance, three feet west of the doors, next to a wall heater. The station is monumented with a USAF Gravity Base Station disc. (1)



**REFERENCE SOURCE**

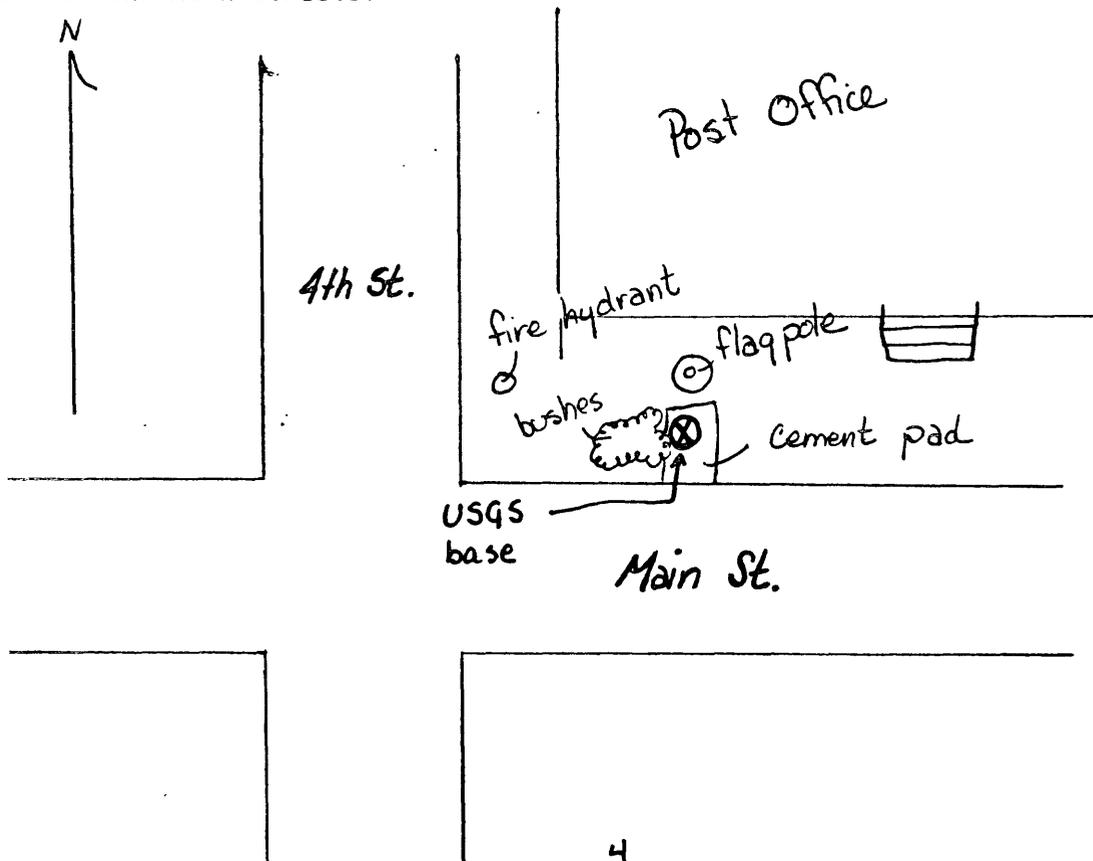
(1) 03405

U.S. GEOLOGICAL SURVEY  
GRAVITY BASE STATION

STATE/COUNTRY		STATION DESIGNATION		OBSERVED GRAVITY
Montana		Hamilton Post Office		980318.74 mgals
NEAREST TOWN		LONGITUDE		LATITUDE
Hamilton		114° 09.54'		46° 14.83'
ELEVATION		TOPOGRAPHIC MAP(S)		
3570 ft (1088.1 m)		Hamilton 1:250,000, Hamilton South 1:24,000		
DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
8/29/78	Kleinkopf	G-235	Missoula Airport	980429.45 mgals

DESCRIPTION/SKETCH

Base is located south of the flagpole at east edge of bushes on a concrete pad near the southwest corner of Post Office. Post Office is at the northeast corner of 4th and Main Streets.

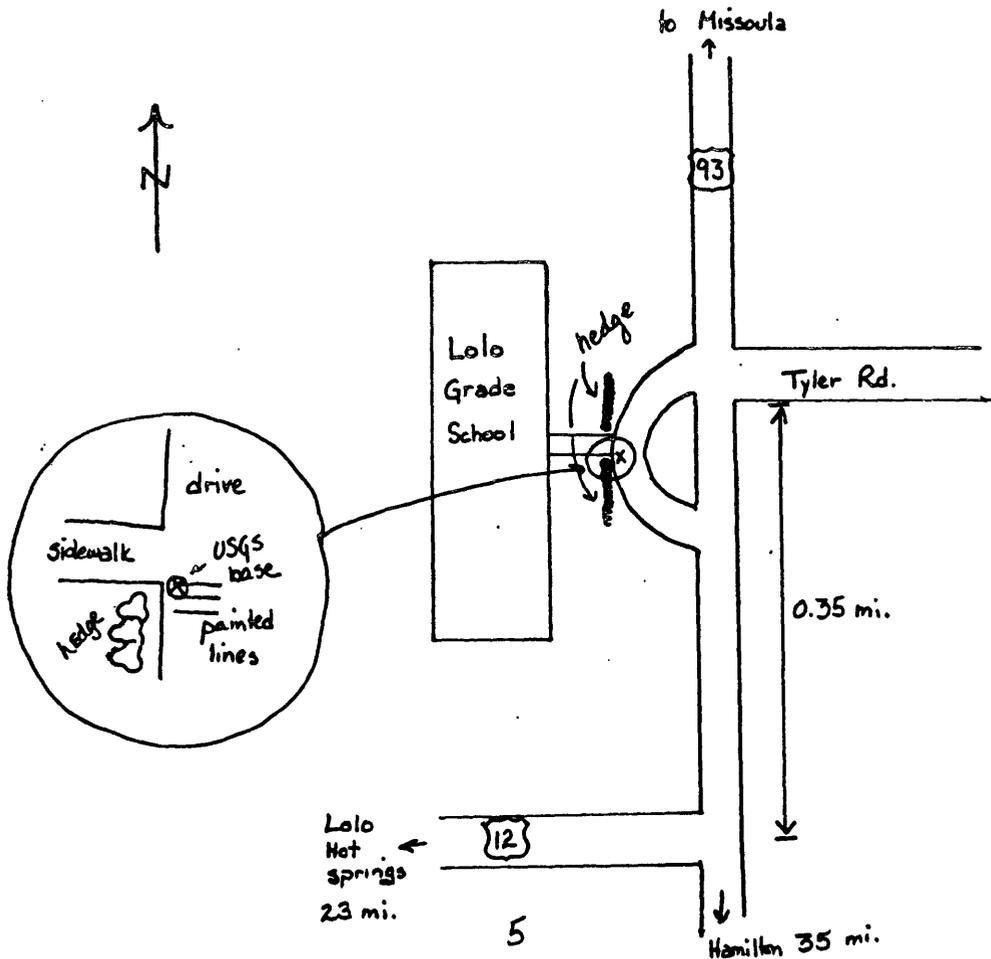


U.S. GEOLOGICAL SURVEY  
GRAVITY BASE STATION

STATE/COUNTRY MONTANA		STATION DESIGNATION Lolo Grade School		OBSERVED GRAVITY 980424.30 mgals
NEAREST TOWN Lolo		LONGITUDE 114° 04.86'		LATITUDE 46° 45.74'
ELEVATION 3192' (972.9 m)		TOPOGRAPHIC MAP(S) Southwest Missoula 1:24,000    Hamilton 1:250,000		
DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
7-21-80	Bankey	G-24	Hamilton USGS Base	980318.74 mgals.

DESCRIPTION/SKETCH

The base is located at Lolo Grade School, in the town of Lolo, Mont., which is 0.35 miles north of the intersection of US 93 and US 12 west. The base is located at the southwest corner of the main walk and the curved driveway, on the sidewalk 3 feet east of the hedge.

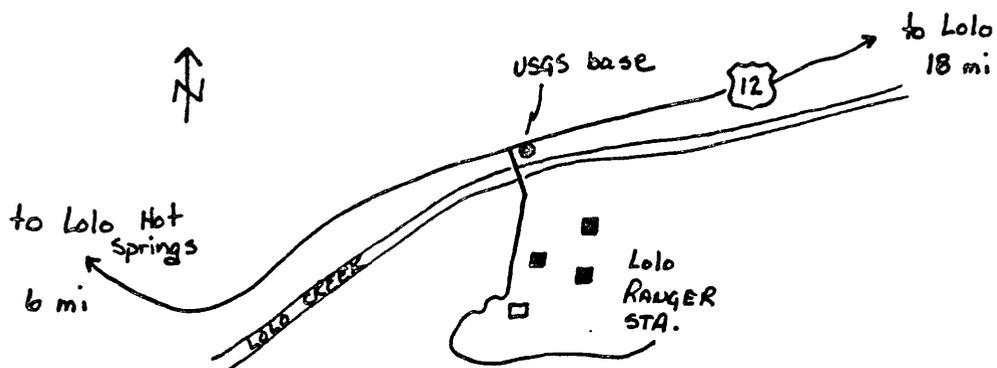


GRAVITY BASE STATION  
U.S. GEOLOGICAL SURVEY

STATE/COUNTRY Montana		STATION DESIGNATION Lolo Ranger Station		OBSERVED GRAVITY 980382.71 mgals
NEAREST TOWN Lolo		LONGITUDE 114° 26.07'		LATITUDE 46° 46.47'
ELEVATION 3851 ft (1173.7 m)		TOPOGRAPHIC MAP(S) Hamilton 1:250,000 Garden Point 1:24,000		
DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
8/74	Wilson	G-159	Missoula Airport	980429.45 mgals

DESCRIPTION/SKETCH

Base is located at Bench Mark 3851' on U.S. Highway 12 at entrance to Lolo Ranger Station, approximately 18 miles west of Lolo, Montana, and 6 miles east of Lolo Hot Springs.

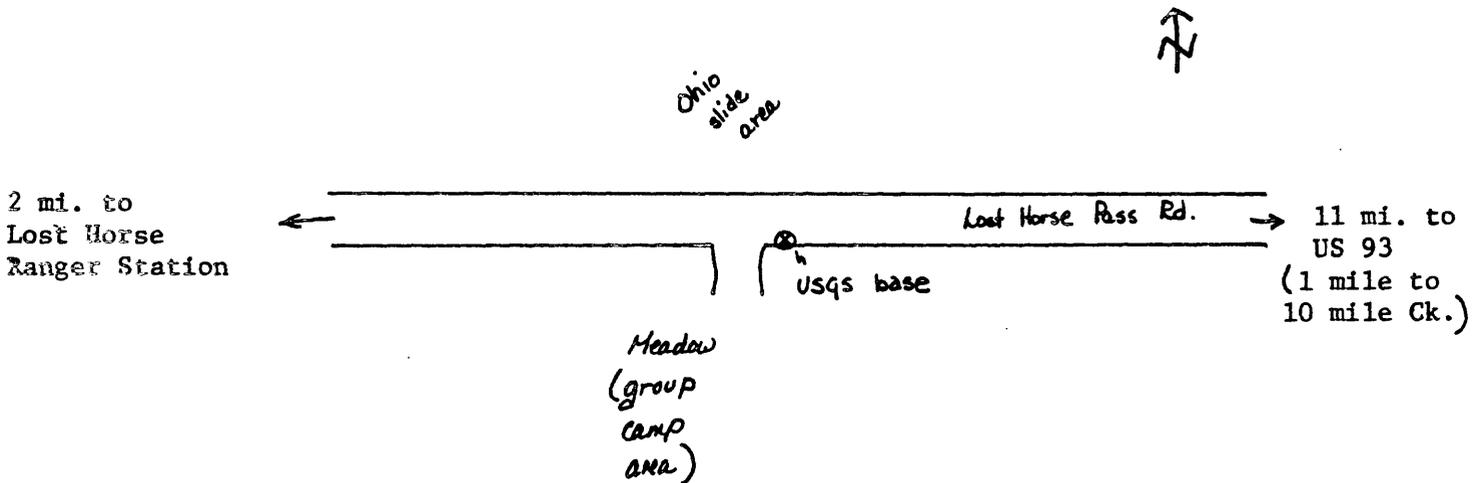


U.S. GEOLOGICAL SURVEY  
GRAVITY BASE STATION

STATE/COUNTRY		STATION DESIGNATION		OBSERVED GRAVITY
MONTANA		Lost Horse Base		980215.16 mgals.
NEAREST TOWN		LONGITUDE		LATITUDE
Hamilton, Mt.		114° 26.16'		46° 08.46'
ELEVATION		TOPOGRAPHIC MAP(S)		
5460' est. (1664.2 m)		Tenmile Lake 1:24,000, Hamilton I:250,000		
DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
7-5-80	Brickey	G-550	Hamilton USGS Base	980318.74 mgals

DESCRIPTION/SKETCH

The base is located on the south side of Lost Horse Pass Road, at the turnoff to the group camp area across from Ohio Slide (a talus slope). The turnoff is about 11 miles west of the junction of U.S. Hwy 93 and Lost Horse Pass Road. That junction is about 1 mile south of Charlos, Mt. The base is read on a large rock buried in the roadside.

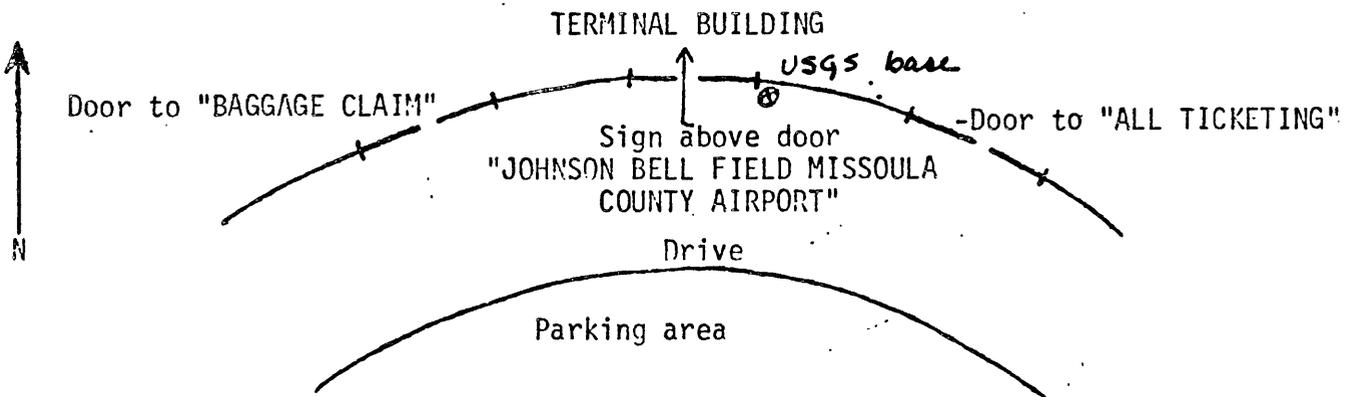


U.S. GEOLOGICAL SURVEY  
GRAVITY BASE STATION

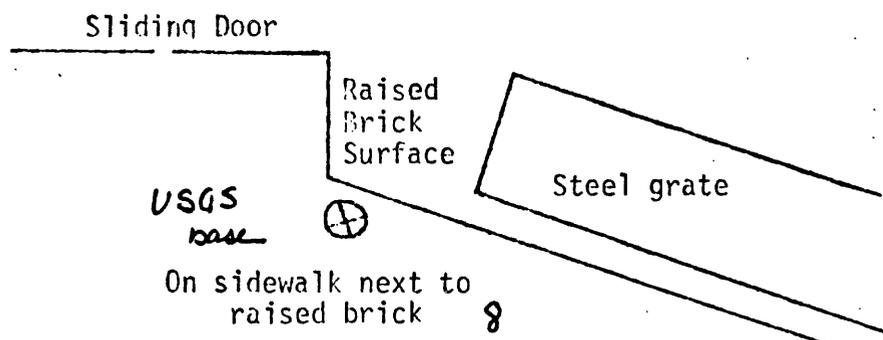
STATE/COUNTRY MONTANA		STATION DESIGNATION MISSOULA AIRPORT		OBSERVED GRAVITY 980429.45 (IGSN-71) <i>mgals</i>
NEAREST TOWN MISSOULA		LONGITUDE 114°06.50'		LATITUDE 46°55.00'
ELEVATION 3200 ft est (976 m)		TOPOGRAPHIC MAP(S) HAMILTON 1:250,000, NORTHWEST MISSOULA 1:24,000		
DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
7/2/75	Kleinkopf/Wilson	G-159	Missoula DOD	980429.45 <i>mgals</i>

DESCRIPTION/SKETCH

Base is located on the concrete walk and just right of the central set of sliding doors at a street entrance to terminal building. Department of Defense (DOD) base was located in the terminal building and beyond the security area on tile floor, one foot west of the exit to the apron and aircraft. The DOD location is now questionable since the remodeling work on the terminal building.



DETAIL OF GRAVITY BASE LOCATION

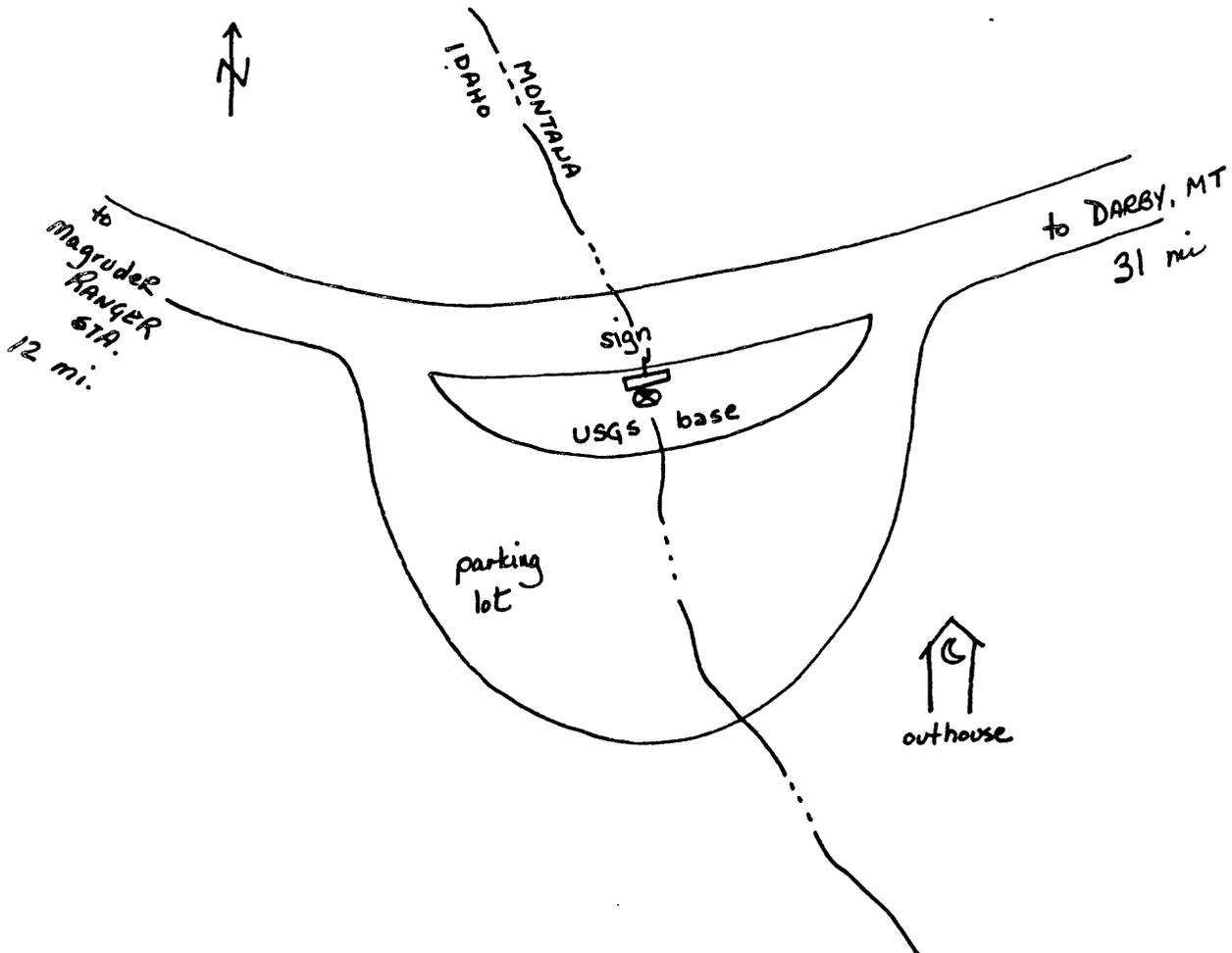


GRAVITY BASE STATION  
U.S. GEOLOGICAL SURVEY

STATE/COUNTRY Montana		STATION DESIGNATION Nez Perce Pass		OBSERVED GRAVITY 980487.40 mgals
NEAREST TOWN West Fork		LONGITUDE 114° 30.10'		LATITUDE 45° 43.02'
ELEVATION 6587 ft (2007.7 m)		TOPOGRAPHIC MAP(S) Nez Perce Peak 1:24,000 Elk City 1:250,000		
DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
8/79	Brickey	G-235	Hamilton P.O.	980318.74 mgals

DESCRIPTION/SKETCH

Base located at the Continental Divide below sign giving elevation at Nez Perce Pass, in the Blue Joint Wilderness.

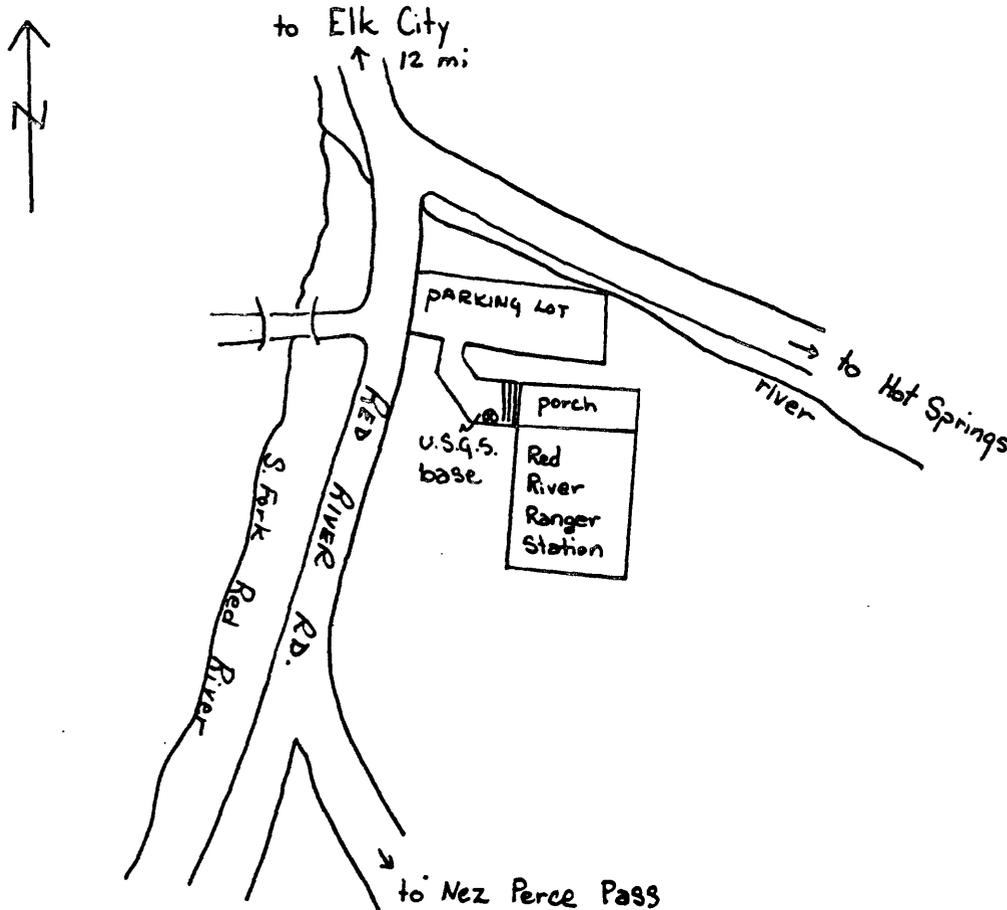


**U.S. GEOLOGICAL SURVEY  
GRAVITY BASE STATION**

<b>STATE/COUNTRY</b> Idaho		<b>STATION DESIGNATION</b> Red River Ranger Station		<b>OBSERVED GRAVITY</b> 980241.02 mgal
<b>NEAREST TOWN</b> Elk City		<b>LONGITUDE</b> 115° 20.56'		<b>LATITUDE</b> 45° 42.60'
<b>ELEVATION</b> 4360 ft est (1328.9 m)		<b>TOPOGRAPHIC MAP(S)</b> Elk City 1:250,000 Trapper Creek 1:24,000		
<b>DATE</b>	<b>OBSERVER</b>	<b>METER</b>	<b>REFERENCE STATION</b>	<b>REFERENCE VALUE</b>
8/10/79	Brickey	G-235	Lowell, Idaho	980489.73 mgal

**DESCRIPTION/SKETCH**

Ranger Station is approximately 12 mi southwest of Elk City on Red River Road. Base is on concrete sidewalk at base of wooden steps, on southern end of sidewalk at Ranger Station.

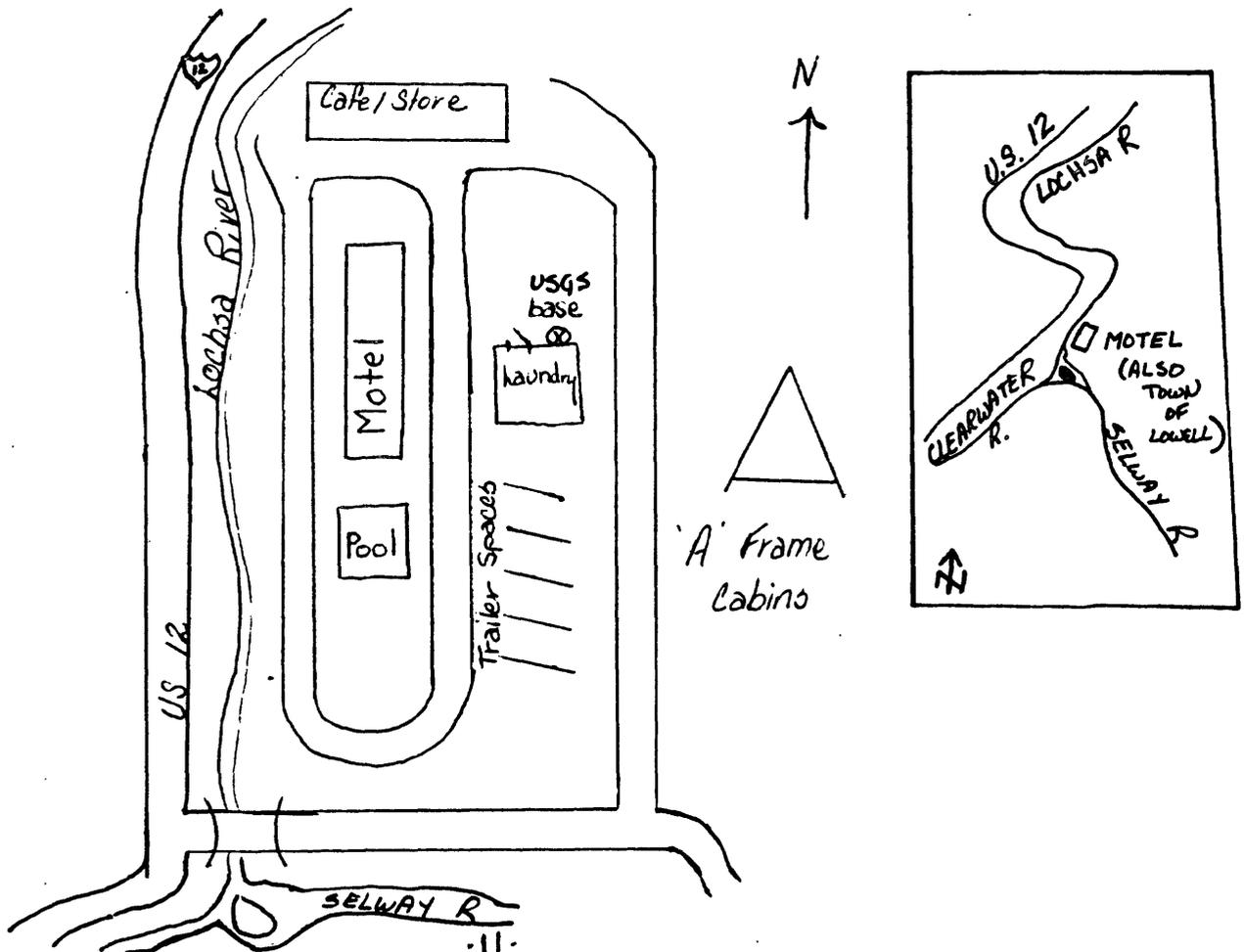


U.S. GEOLOGICAL SURVEY  
GRAVITY BASE STATION

STATE/COUNTRY		STATION DESIGNATION		OBSERVED GRAVITY
Idaho		Three Rivers Motel (S-1)		980489.73 mgals
NEAREST TOWN		LONGITUDE		LATITUDE
Lowell		115° 35.69'		46° 08.67'
ELEVATION		TOPOGRAPHIC MAP(S)		
1465 ft (446.6 m)		Lowell 1:24,000 , Hamilton 1:250,000		
DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
8/2/78	Kleinkopf/Brickey	G-235	Grangeville	980382.52 mgals

DESCRIPTION/SKETCH

Meter read on cement slab, one meter east of door at north end of laundry building.  
Base is beneath electrical outlet, about 0.15 meters out from wall.



**U.S. GEOLOGICAL SURVEY  
GRAVITY BASE STATION**

<b>STATE/COUNTRY</b> Montana		<b>STATION DESIGNATION</b> West Fork Ranger Station		<b>OBSERVED GRAVITY</b> 980232.32 mgal.
<b>NEAREST TOWN</b> Darby		<b>LONGITUDE</b> 114° 15.52'		<b>LATITUDE</b> 45° 48.82'
<b>ELEVATION</b> 4400 ft est. (1341 m)		<b>TOPOGRAPHIC MAP(S)</b> Hamilton 1:250,000 Boulder Peak 1:24,000		
<b>DATE</b>	<b>OBSERVER</b>	<b>METER</b>	<b>REFERENCE STATION</b>	<b>REFERENCE VALUE</b>
8/3/79	Brickey	G-235	Hamilton P.O.	980318.74 mgal

**DESCRIPTION/SKETCH**

Base is located at West Fork Ranger Station, on the west end of the top step of the cement porch on south side of the Ranger Station.

