

INTRODUCTION TO TOPOGRAPHIC MAPS

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All of the following questions refer to the Monmouth, OR Quadrangle.

1) What is the fractional scale, contour interval, and magnetic declination of this map?

a) Scale: 1:24,000 b) Contour Interval: 10 ft. c) Declination: 19°E

2) What quadrangle maps are located immediately adjacent to the Monmouth Quad.?

a) North: Rickreal b) South: Lewisburg c) East: Sidney d) West: Airlie North

3) What is the quadrangle size series of this map (in long. and lat.)?

4) What is the date of publication of this map?

7.5 min
1970 (photo revised 1986)

5) What does the tick with 4956000m N. mean? (lower right of map)

UTM demarcation

6) What is the name of the major fluvial system flowing through this area. Of What larger drainage basin(s) does this river form a part of?

Williamette River, Columbia River Basin

7) What is the approximate elevation of the Natural Sciences Building based on the map representation? 210 ft

8) Given the fractional scale determine the following

1 in = 24,000 in 12 in = 1 ft 5280 ft = 1 mile
5 inches on the map = $\frac{10,000}{1}$ Feet on ground = 1.89 Miles on ground.
10 inches on the map = $\frac{6097.6}{3.28}$ Meters on ground = 1.89 Kilometers on ground.
3.28 ft = 1 m 1000 m = 1 km

9) A. What is the road distance in miles along Rt. 99 between Helmick State Park and Monmouth city limits? = 13 in \times 24,000 = 312,000 in $\left(\frac{ft}{12 in}\right) \left(\frac{mi}{5280 ft}\right) = 4.92$ miles

B. What is the distance in kilometers?

$4.92 \text{ mi} \left(\frac{5280 \text{ ft}}{mi}\right) \left(\frac{m}{3.28 \text{ ft}}\right) \left(\frac{km}{1000 m}\right) = 7.93 \text{ km}$

10) A. Determine the average stream gradients (in Ft/Mi) for the following drainages:

A. Willamette River: Gradient: 177-153 = 24 ft Length: 105-93 mi = 12 mi $\frac{24 \text{ ft}}{12 \text{ mi}} = \boxed{2 \text{ ft/mi}}$
B. Luckiamute River: Gradient: 312-157 = 155 ft Length: 13-5 mi = 8 mi $\frac{155 \text{ ft}}{8 \text{ mi}} = \boxed{19.4 \text{ ft/mi}}$

11) A. What is the highest point of elevation represented on this map? 880 ft.

B. What is the lowest point of elevation represented on this map? 150 ft

C. What is the maximum relief. 880 ft - 150 ft = 730 ft.

12) A. What is the longitude and latitude location of the road intersection at Buena Vista

$\frac{51}{.95} \left(\frac{3.9}{1}\right) = 1.15'$ $44^\circ 46' 10''$, $123^\circ 65' 47''$

B. What is the longitude and latitude location of Davidson Hill?

$\frac{19}{.375} \left(\frac{3.7}{1}\right) = 1.713'$ $44^\circ 45' 54''$, $123^\circ 11' 15''$

C. What is the straight line distance in miles between these two points?

$5 \text{ in} \times 24,000 = 120,000 \text{ in} \left(\frac{ft}{12 in}\right) \left(\frac{mi}{5280 ft}\right) = \boxed{1.89 \text{ miles}}$

D. What is the azimuth bearing FROM Davidson Hill TOWARDS Buena Vista?

085°

E. What is the quadrant bearing FROM Buena Vista TOWARDS Davidson Hill?

S85°W

13) A. What is the nature of the topographic slope in the vicinity of the town of Monmouth?

gently sloping

C. What is the local relief between WOU and the Willamette adjacent to Independence?

210 - 150 = 60 ft

D. Is the outline of the topography east of Independence relatively arcuate or irregular in outline?

irregular

E. What processes might have formed the pattern in D above?

possibly landslides or unstable hill slopes

14) Examine the cultural activity immediately north of Monmouth and Independence.

A. Write a brief assessment of the potential for environmental degradation to the surface and groundwater of this area. List three types of water quality degradation (i.e. contamination) problems that may exist in this area.

One source of environmental degradation that is likely is from agricultural runoff in the area, as agriculture is the predominant land use in the area.

a second source of environmental degradation that may occur is from urban runoff from the the urban sections of the map (the Monmouth / Independence areas)

a third source of potential water contamination that may occur is from industrial runoff from anthropogenic industrial activity in the area of urban center (Union City).

18. Determine the elevations of the following locations:

A. Wigrich 260 ft.

B. Oak Hill (SC) 476 ft

C. Dicker Reservoir (NE) 450 ft

D. Davidson Bridge (SC) 160 ft

19. Draw a topographic profile along a line connecting Oak Hill (SC) to Vitae Springs. Use a horizontal scale of 1 in = 4000 Ft, and a vertical scale of 1 in = 333.33 ft (see attached profile paper).

A. Determine the minimum slope grade represented on the profile in percent.

1% Willamette River to Burlington Northern

B. Determine the maximum slope grade represented on the profile in percent.

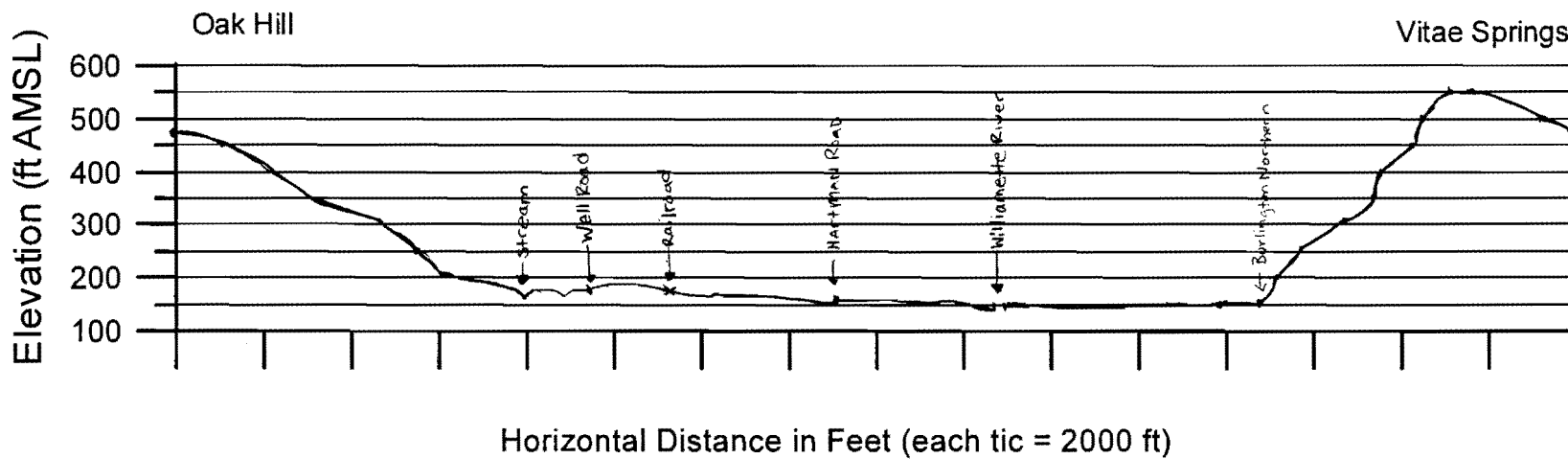
9% Burlington Northern to Vitae Springs

C. Where are the areas most likely associated with flooding?

Willamette River & adjacent

D. The vertical exaggeration of a profile is calculated by: $VE = H \text{ scale} / V \text{ scale}$; Calculate the vertical exaggeration represented on the attached profile.

Topographic Profile from Oak Hill to Vitae Springs, Monmouth, OR Quad.



Horizontal Scale: 1 in = 4000 ft
 Vertical Scale: 1 in = 333.33 ft

$$V.E. = HV = \frac{1/4000}{1/333.33} = .0833 \text{ ft/ft V.E.}$$