

UNITED STATES
DEPARTMENT OF
AGRICULTURE

NATURAL RESOURCES
CONSERVATION
SERVICE

1551 BALDY AVE.
POCATELLO, ID.
83201-1551

RECEIVED

SEP 11 2002

Department of Water Resources

Sep. 26, 2001

George Chandler
3440 N. Rapid Creek Rd.
Inkom, ID 83245

Dear Mr. Chandler:

Attached is the soil and crop information you requested.

The first two pages are the location map and the soils map. The next four pages are a narrative of the soil types you have. The blue sheet shows what the expected seasonal use is for alfalfa in your area.

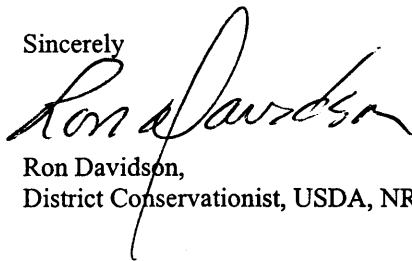
The last page is a recommended irrigation schedule based on crop and soil types.

The soils are generally very gravelly and have a relatively low water holding capacity. Assuming that peak daily consumptive use for alfalfa for your area is around 0.28 inches per day it is recommended that not more than 10 days pass without an irrigation, (see Sheet 2 of 6 of ID-ENG-40).

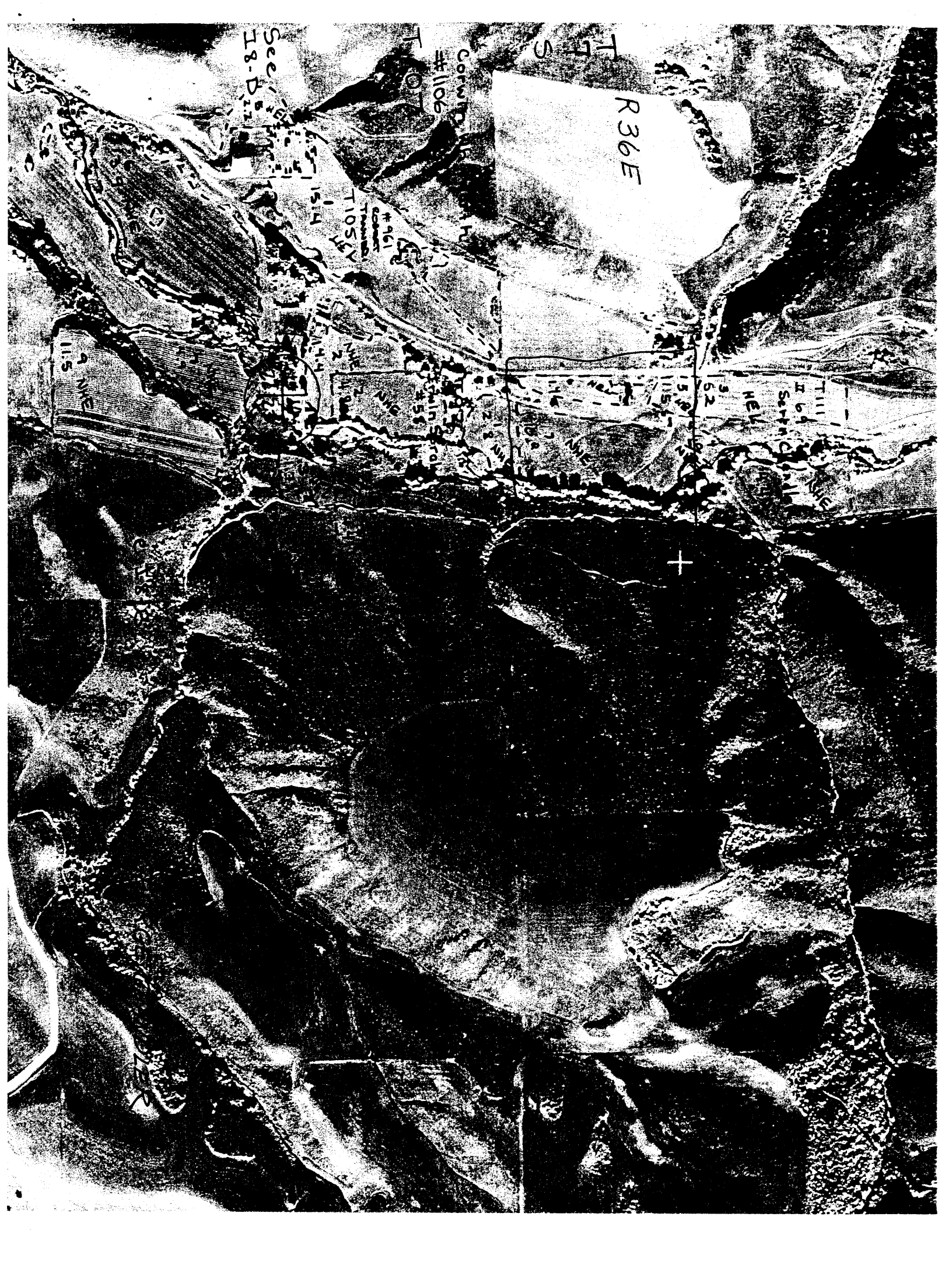
The blue sheet indicates the seasonal use for alfalfa in the Inkom area is 19.0 inches.

I hope this information is helpful to you. Please feel free to contact our office if we can be of any further assistance to you.

Sincerely



Ron Davidson,
District Conservationist, USDA, NRCS



T 36E

T 105

Corridor
#1106

T 105
#961
Robert
Thomson

Sec 1
18-D-22

T 111
H 6
Seth C

HE

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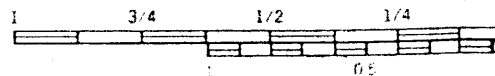
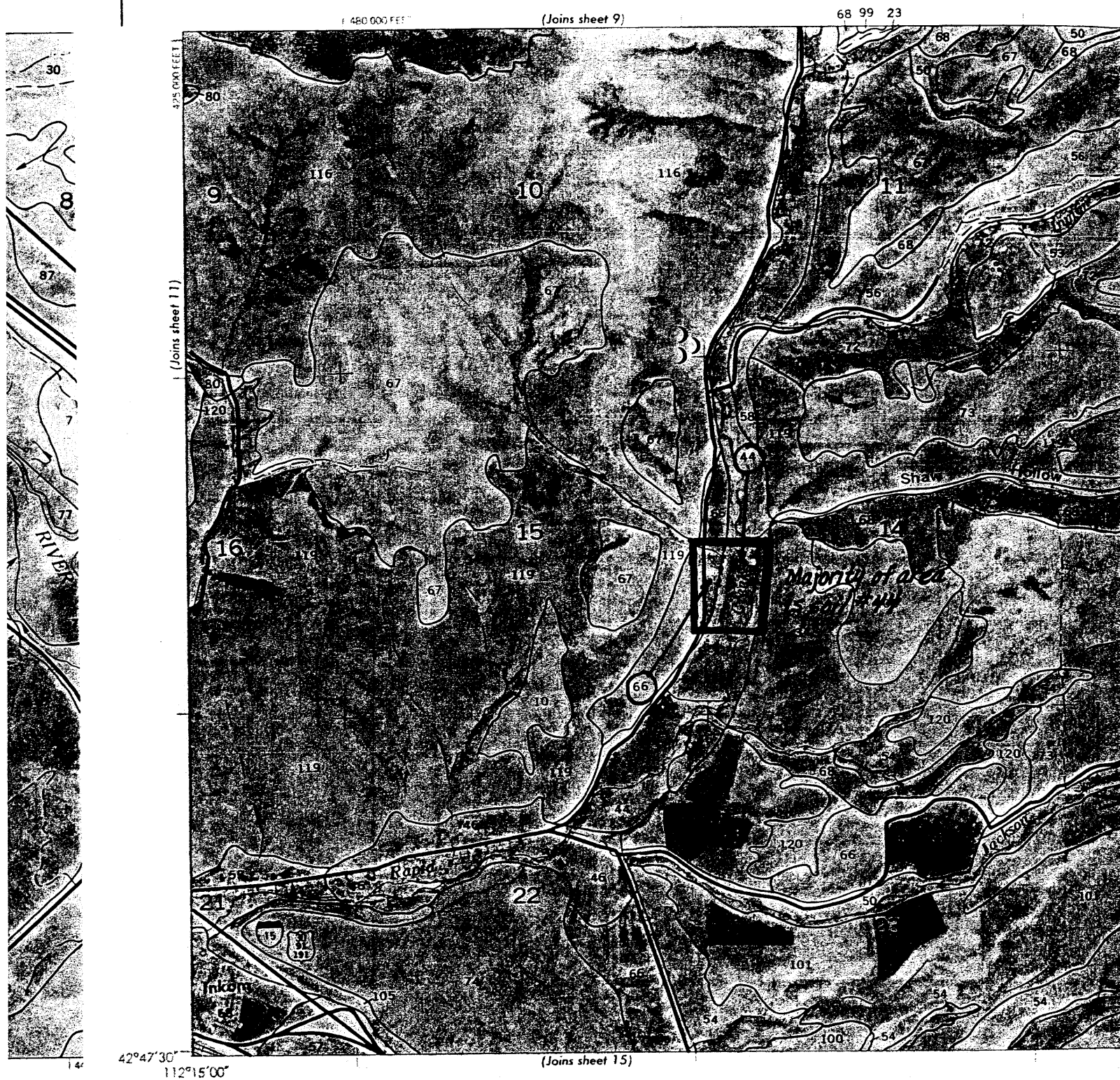
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43—Downey-Arimo complex, 3 to 8 percent slopes.

This map unit is on terraces. The vegetation in areas not cultivated is mainly shrubs and grasses. Elevation is about 4,600 to 4,900 feet. The average annual precipitation is about 13 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is about 95 days.

This unit is about 55 percent Downey gravelly silt loam and about 30 percent Arimo silt loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included areas make up about 15 percent of the total acreage of this unit. Of this, about 5 percent is a soil that is similar to the Downey soil but has a stony silt loam surface layer and is on terrace breaks and about 5 percent is a soil that is similar to the Downey soil but is less than 10 inches deep to sand and gravel and is in slightly convex areas. The remaining 5 percent is small areas of soils that have slopes of less than 3 percent or more than 8 percent and Bear Lake silt loam.

The Downey soil is very deep and well drained. It formed in silty alluvium overlying flood-deposited sand and gravel of mixed mineralogy. Typically, the surface layer is brown gravelly silt loam 12 inches thick. The upper 5 inches of the underlying material is very pale brown, calcareous gravelly silt loam, and the lower part to a depth of 60 inches or more is multicolored, calcareous extremely gravelly coarse sand. Depth to extremely gravelly coarse sand is 12 to 20 inches.

Permeability of the Downey soil is moderate to a depth of 17 inches and very rapid below this depth. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is moderate. If this soil is irrigated, runoff is rapid and the hazard of water erosion is high.

The Arimo soil is very deep and well drained. It formed in loess and silty alluvium overlying flood-deposited sand and gravel of mixed mineralogy. Typically, the surface layer is grayish brown silt loam 6 inches thick. The subsoil is brown silt loam 12 inches thick. The upper 15 inches of the substratum is white, calcareous silt loam, and the lower part to a depth of 60 inches or more is multicolored, calcareous extremely gravelly coarse sand. Depth to extremely gravelly coarse sand ranges from 20 to 40 inches.

Permeability of the Arimo soil is moderate to a depth of 33 inches and very rapid below this depth. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is moderate. If this soil is irrigated, runoff is rapid and the hazard of water erosion is high.

Most areas of this unit are used as irrigated cropland and rangeland. A few areas are used as nonirrigated cropland and for homesite and urban development.

This unit is suited to irrigated crops. It is used mainly for the production of wheat, barley, and alfalfa hay. The unit is limited mainly by the droughtiness of the Downey

soil and the high hazard of water erosion. Because the Downey soil is droughty, applications of irrigation water should be light and frequent. Sprinkler irrigation is a suitable method of applying water. Use of this method permits the even, controlled application of water, reduces runoff, and minimizes the risk of erosion. Irrigation water needs to be applied at a rate that insures optimum production without increasing deep percolation, runoff, and erosion. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Tillage should be kept to a minimum.

This unit is well suited to use as rangeland. The potential natural plant community on the unit is mainly Wyoming big sagebrush, bluebunch wheatgrass, Thurber needlegrass, and arrowleaf balsamroot. This unit is well suited to the use of mechanical equipment such as rangeland plows and drills. Livestock watering facilities need to be developed or improved for summer and fall use of this unit. The unit is limited for livestock watering ponds and other water impoundments by the seepage potential.

This unit is poorly suited to nonirrigated crops. It is used for the production of wheat and barley. The unit is limited mainly by low precipitation, the droughtiness of the Downey soil, and the hazard of water erosion. Because precipitation is not sufficient for annual cropping, a cropping system that includes small grain and summer fallow is most suitable. Erosion is reduced if fall grain is seeded early, stubble mulch tillage is used, and tillage and seeding are on the contour or across the slope. Also, waterways should be shaped and seeded to perennial grass. On long slopes, chiseling the stubble in fall slows runoff and reduces soil loss in years when the snow melts rapidly while the soil is still frozen. Chiseling also promotes better aeration. Maintaining 1,500 pounds or more of straw on the surface at planting time reduces runoff, conserves moisture, and helps to maintain soil tilth and organic matter content.

If this unit is used for homesite and urban development, the main limitations are the hazard of frost action in the silty overlying material, the hazard of cutbanks caving in and the seepage potential in the underlying extremely gravelly coarse sand, and slope. Frost action potential is a limitation in maintaining roads, streets, driveways, and sidewalks. If the density of housing is moderate to high, community sewage systems help to prevent contamination of ground water as a result of seepage from onsite sewage disposal systems. Cutbanks are not stable and are subject to slumping.

This map unit is in capability subclasses IIIe, irrigated, and VIe, nonirrigated.

44—Enochville-Enochville Variant complex, 0 to 1 percent slopes.

This map unit is on stream terraces. The native vegetation is mainly sedges and grasses. Elevation is about 6,000 to 6,400 feet. The average annual precipitation is about 18 inches, the average

annual air temperature is about 41 degrees F, and the average frost-free period is about 60 days.

This unit is about 40 percent Enochville silt loam and about 35 percent Enochville Variant gravelly silt loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included areas make up about 25 percent of the total acreage of this unit. Of this, about 5 percent is Holmes very cobbly loam on terrace escarpments, about 10 percent is soils that have a water table at or near the surface, and about 5 percent is soils that are similar to the Enochville and Enochville Variant soils but are moderately well drained and are in convex areas and near the edges of the bottom lands. The remaining 5 percent is small areas of very poorly drained soils that have more than 35 percent clay in the subsoil and upper part of the substratum and soils that have slopes of more than 1 percent.

The Enochville soil is very deep and poorly drained. It formed in alluvium derived from mixed sources. Typically, the surface layer is very dark grayish brown silt loam 12 inches thick. The subsoil is dark grayish brown silty clay loam 8 inches thick. The upper 23 inches of the substratum is grayish brown silt loam, and the lower part to a depth of 60 inches or more is pale olive and pale yellow very cobbly sandy loam and extremely cobbly sandy loam.

Permeability of the Enochville soil is moderately slow. Available water capacity is high. Effective rooting depth for plants, except those that are water tolerant, is limited by a seasonal high water table that is at a depth of 1 to 2 feet from April through June. Runoff is slow, and the hazard of water erosion is slight. This soil is frequently flooded for brief periods from February through June.

The Enochville Variant soil is very deep and poorly drained. It formed in alluvium derived from mixed sources. Typically, the surface layer is dark grayish brown, calcareous gravelly silt loam 11 inches thick. Below this to a depth of 18 inches is a buried surface layer of dark grayish brown, calcareous gravelly silt loam. The next layer is a buried subsoil of dark grayish brown gravelly silt loam 6 inches thick. The upper 6 inches of the substratum is grayish brown very gravelly loam, and the lower part to a depth of 60 inches or more is light brownish gray and light gray, calcareous extremely gravelly loam.

Permeability of the Enochville Variant soil is moderate. Available water capacity is low. Effective rooting depth for plants, except those that are water tolerant, is limited by a seasonal high water table that is at a depth of 1 to 2 feet from April through June. Runoff is slow, and the hazard of water erosion is slight. This soil is frequently flooded for brief periods from February through June.

This unit is used as rangeland.

This unit is suited to use as rangeland. The potential natural plant community on the unit is mainly sedges,

basin wildrye, and slender wheatgrass. The main limitations are the seasonal high water table and frequent flooding late in winter and in spring. Grazing should be delayed until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure. The main limitation for rangeland seeding on this unit is the hazard of frequent flooding.

This map unit is in capability subclass Vw.

45—Greys-Pavohroo-Sedgway association, 8 to 20 percent slopes. This map unit is on mountain foot slopes. Elevation is about 6,000 to 7,000 feet.

This unit is about 50 percent Greys silt loam, about 20 percent Pavohroo silt loam, and about 20 percent Sedgway gravelly silt loam. The Greys soil is on slightly concave to plane slopes, the Pavohroo soil is on slightly convex to plane slopes, and the Sedgway soil is on convex ridges and near drainageways.

Included areas make up about 10 percent of the total acreage of this unit. Of this, about 5 percent is Yago extremely stony silty clay loam in convex areas on ridges. The remaining 5 percent is small areas of very deep, poorly drained soils near springs, a very deep soil in drainageways, Hades gravelly silt loam, and soils that have slopes of less than 8 percent or more than 20 percent.

The Greys soil is very deep and well drained. It formed in loess and in silty alluvium derived from loess. The native vegetation is mainly trees and grasses. The average annual precipitation is about 20 inches, the average annual air temperature is about 40 degrees F, and the average frost-free period is about 60 days. Typically, an intermittent duff layer of leaves, twigs, and grasses about 3 inches thick is on the surface. The surface layer is dark grayish brown silt loam 8 inches thick. The upper 4 inches of the subsurface layer is light brownish gray silt loam, and the lower part, to a depth of 19 inches, is 60 percent light brownish gray silt loam and 40 percent brown silt loam. The subsoil to a depth of 60 inches or more is brown, light yellowish brown, and pale brown silt loam.

Permeability of the Greys soil is moderately slow. Available water capacity is very high. Effective rooting depth is 60 inches or more. Runoff is very rapid, and the hazard of water erosion is very high.

The Pavohroo soil is very deep and well drained. It formed in silty alluvium and colluvium derived from loess and various kinds of sedimentary and metasedimentary rock. The native vegetation is mainly trees and shrubs. The average annual precipitation is about 25 inches, the average annual air temperature is about 39 degrees F, and the average frost-free period is about 40 days. Typically, an intermittent duff layer of needles, leaves, and twigs about 3 inches thick is on the surface. The surface layer is dark grayish brown silt loam 26 inches

grasses. Elevation is about 4,500 to 5,400 feet. The average annual precipitation is about 14 inches, the average annual air temperature is about 43 degrees F, and the average frost-free period is about 90 days.

Typically, the surface layer is brown, calcareous silt loam 10 inches thick. The subsoil is brown, calcareous silt loam 23 inches thick. The next layer to a depth of 60 inches or more is a buried subsoil of pale brown, calcareous silt loam.

Included areas make up about 15 percent of the total acreage of this unit. Of this, about 5 percent is Hondoho cobbly silt loam near drainageways and about 5 percent is Inkom silt loam in concave areas. The remaining 5 percent is small areas of Arbone silt loam, Arimo silt loam, and soils that are similar to this Joevar soil but have a weakly cemented pan at a depth of 15 to 30 inches.

Permeability of this Joevar soil is moderate. Available water capacity is very high. Effective rooting depth is 60 inches or more. In both irrigated and nonirrigated areas, runoff is slow and the hazard of water erosion is slight.

Most areas of this unit are used as irrigated and nonirrigated cropland. A few areas are used as rangeland.

This unit is well suited to irrigated crops. It is used for the production of wheat, barley, and alfalfa hay. It has few limitations. Sprinkler irrigation is a suitable method of applying water. Use of this method permits the even, controlled application of water, reduces runoff, and minimizes the risk of erosion. Irrigation water needs to be applied at a rate that insures optimum production without increasing deep percolation, runoff, and erosion. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

This unit is well suited to nonirrigated crops. It is limited mainly by low precipitation. Because precipitation is marginal for annual cropping, the cropping system commonly includes small grain and summer fallow. On long slopes, chiseling the stubble in fall slows runoff and reduces soil loss in years when the snow melts rapidly while the soil is still frozen. Chiseling also promotes better aeration. Maintaining 1,500 pounds per acre or more of straw on the surface at planting time reduces runoff, conserves moisture, and helps to maintain soil tilth and organic matter content.

This unit is very susceptible to the formation of a tillage pan and other compacted layers, which reduce the permeability of the soil and restrict root penetration. Deep subsoiling in fall helps to break up the compacted layers.

This unit is well suited to use as rangeland. The potential natural plant community on the unit is mainly bluebunch wheatgrass, basin big sagebrush, and Nevada bluegrass. The suitability of this unit for rangeland seeding is good.

This map unit is in capability subclass IIIc, irrigated and nonirrigated.

65—Lanoak silt loam, 1 to 4 percent slopes. This very deep, well drained soil is on terraces. It formed in loess and in silty alluvium derived from loess. The vegetation in areas not cultivated is mainly shrubs and grasses. Elevation is about 4,900 to 5,600 feet. The average annual precipitation is about 17 inches, the average annual air temperature is about 43 degrees F, and the average frost-free period is about 80 days.

Typically, the surface layer is dark grayish brown silt loam 22 inches thick. The subsoil is grayish brown and pale brown silt loam 22 inches thick. The substratum to a depth of 60 inches or more is light gray, calcareous silt loam.

Included areas make up about 15 percent of the total acreage of this unit. Of this, about 5 percent is Joevar silt loam in concave areas and along drainageways and about 5 percent is Hondoho gravelly silt loam in convex areas along drainageways. The remaining 5 percent is small areas of Arbone silt loam and soils that have slopes of less than 1 percent or more than 4 percent.

Permeability of this Lanoak soil is moderate. Available water capacity is very high. Effective rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is moderate.

Most areas of this unit are used as nonirrigated cropland. A few areas are used as rangeland.

The Lanoak soil is well suited to nonirrigated crops. It is used for the production of wheat, barley, and a small amount of alfalfa hay. The unit is limited mainly by the short growing season and the hazard of water erosion. In some years the growing season is shorter than normal, which significantly reduces yields of crops. Erosion is reduced if fall grain is seeded early, stubble mulch tillage is used, and tillage and seeding are on the contour or across the slope. Also, waterways should be shaped and seeded to perennial grass. On long slopes, chiseling the stubble in fall slows runoff and reduces soil loss in years when the snow melts rapidly while the soil is still frozen. Chiseling also promotes better aeration. Maintaining 1,500 pounds per acre or more of straw on the surface at planting time reduces runoff, conserves moisture, and helps to maintain soil tilth and organic matter content.

This unit is well suited to use as rangeland. The potential natural plant community on the unit is mainly mountain big sagebrush and bluebunch wheatgrass. The suitability of this unit for rangeland seeding is good.

This map unit is in capability subclass IIIc.

66—Lanoak silt loam, 4 to 12 percent slopes. This very deep, well drained soil is on foothills and fan terraces. It formed in loess and in silty alluvium derived from loess. The vegetation in areas not cultivated is mainly shrubs and grasses. Elevation is about 5,000 to 6,500 feet. The average annual precipitation is about 17 inches, the average annual air temperature is about 42 degrees F, and the average frost-free period is about 80 days.

Typically, the surface layer is dark grayish brown silt loam 22 inches thick. The subsoil is grayish brown and pale brown silt loam 22 inches thick. The substratum to a depth of 60 inches or more is light gray, calcareous silt loam.

Included areas make up about 15 percent of the total acreage of this unit. Of this, about 5 percent is Ririe silt loam on south- and west-facing side slopes and hilltops and about 5 percent is Hondo gravelly silt loam on side slopes along drainageways. The remaining 5 percent is small areas of Coalbank very fine sandy loam and soils that have slopes of less than 4 percent or more than 12 percent.

Permeability of this Lanoak soil is moderate. Available water capacity is very high. Effective rooting depth is 60 inches or more. Runoff is rapid, and the hazard of water erosion is high.

Most areas of this unit are used as nonirrigated cropland. A few areas are used as rangeland.

This unit is well suited to nonirrigated crops. It is used for the production of wheat, barley, and a small amount of alfalfa hay. The unit is limited mainly by the high hazard of water erosion and the short growing season. Terraces reduce runoff and the risk of erosion and help to conserve moisture. Erosion can be reduced if fall grain is seeded early, stubble mulch tillage is used, and tillage and seeding are on the contour or across the slope. Also, waterways should be shaped and seeded to perennial grass. On long slopes, chiseling the stubble in fall slows runoff and reduces soil loss in years when the snow melts rapidly while the soil is still frozen. Chiseling also promotes better aeration. Maintaining 1,500 pounds per acre or more of straw on the surface at planting time reduces runoff, conserves moisture, and helps to maintain soil tilth and organic matter content. In some years the growing season is shorter than normal, which significantly reduces yields of crops on the unit.

This unit is well suited to use as rangeland. The potential natural plant community on the unit is mainly mountain big sagebrush and bluebunch wheatgrass. The unit is suited to the use of mechanical equipment such as rangeland plows and drills.

This map unit is in capability subclass IIIe.

67—Lanoak silt loam, 12 to 20 percent slopes. This very deep, well drained soil is on north- and east-facing side slopes of foothills and fan terraces. It formed in loess and in silty alluvium derived from loess. The vegetation in areas not cultivated is mainly shrubs and grasses. Elevation is about 5,000 to 6,500 feet. The average annual precipitation is about 17 inches, the average annual air temperature is about 42 degrees F, and the average frost-free period is about 80 days.

Typically, the surface layer is dark grayish brown silt loam 22 inches thick. The subsoil is grayish brown and pale brown silt loam 22 inches thick. The substratum to

a depth of 60 inches or more is light gray, calcareous silt loam.

Included areas make up about 15 percent of the total acreage of this unit. Of this, about 5 percent is Camelback gravelly silt loam on convex side slopes and about 5 percent is Hades gravelly silt loam along drainageways. The remaining 5 percent is small areas of Moonlight silt loam, Valmar very cobbly silt loam, Watercanyon silt loam, and soils that have slopes of less than 12 percent or more than 20 percent.

Permeability of this Lanoak soil is moderate. Available water capacity is very high. Effective rooting depth is 60 inches or more. Runoff is very rapid, and the hazard of water erosion is very high.

Most areas of this unit are used as nonirrigated cropland. A few areas are used as rangeland.

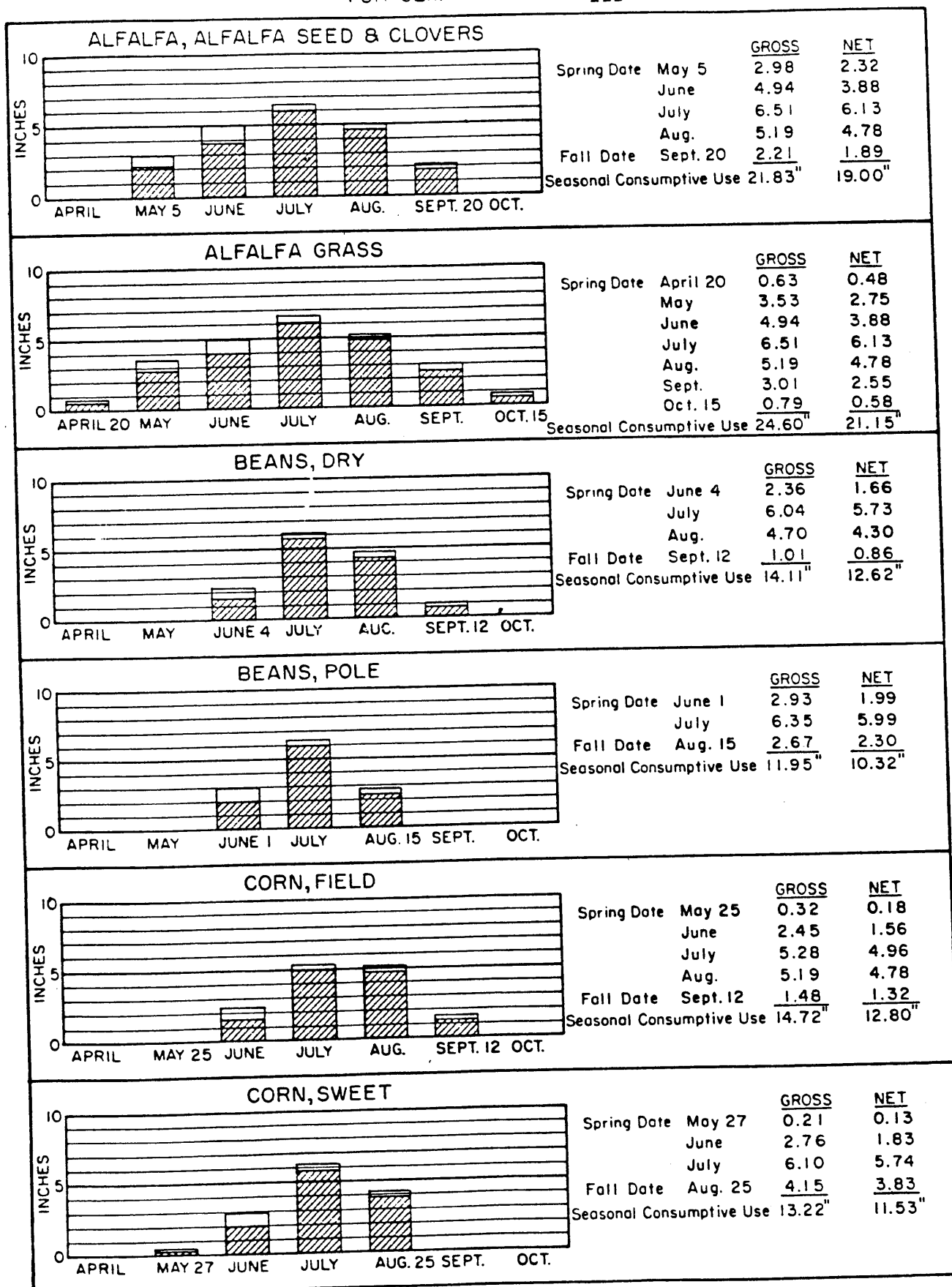
This unit is suited to nonirrigated crops. It is used for the production of wheat, barley, and a small amount of alfalfa hay. The unit is limited mainly by the very high hazard of water erosion and the short growing season. Erosion can be reduced if fall grain is seeded early, stubble mulch tillage is used, and tillage and seeding are on the contour or across the slope. Also, waterways should be shaped and seeded to perennial grass. On long slopes, chiseling the stubble in fall slows runoff and reduces soil loss in years when the snow melts rapidly while the soil is still frozen. Chiseling also promotes better aeration. Maintaining 1,500 pounds per acre or more of straw on the surface at planting time reduces runoff, conserves moisture, and helps to maintain soil tilth and organic matter content. In some years the growing season is shorter than normal, which significantly reduces yields of crops.

This unit is well suited to use as rangeland. The potential natural plant community on the unit is mainly mountain big sagebrush and bluebunch wheatgrass. This unit is suited to the use of mechanical equipment such as rangeland plows and drills. The main limitation is the very high hazard of water erosion. Nonmechanical treatment practices may be more suitable.

This map unit is in capability subclass IVe.

68—Lanoak silt loam, 20 to 30 percent slopes. This very deep, well drained soil is on north- and east-facing side slopes of foothills and fan terraces. It formed in loess and in silty alluvium derived from loess. The vegetation in areas not cultivated is mainly shrubs and grasses. Elevation is about 5,000 to 6,500 feet. The average annual precipitation is about 17 inches, the average annual air temperature is about 42 degrees F, and the average frost-free period is about 80 days.

Typically, the surface layer is dark grayish brown silt loam 22 inches thick. The subsoil is grayish brown and pale brown silt loam 22 inches thick. The substratum to a depth of 60 inches or more is light gray, calcareous silt loam.

Table 683-2.--ESTIMATED SEASONAL AND MONTHLY CONSUMPTIVE USE OF CROPS
FOR CLIMATIC AREA III

SPRINKLER SYSTEM DESIGN DATA

NAME George Chandler DATE 9-25-01 PREPARED BY C. Erickson
SCD Portneuf COUNTY Bannock JOB CLASS NA

I. INVENTORY

Total Acres 40 Crop Acres _____ Climatic Area III
Water Source _____ Amt. Avail. _____ Seasonal Variation _____
Energy Source _____
(Electric) (Int. Comb-Fuel) (Gravity)

II. SOILS DATA

USDA Soils Class Majority	Total Available WHC (in/ft.)					Depth To		Maximum Intake Rate in/hr.
	0-1	1-2	2-3	3-4	4-5	Inhibiting Layer (ft)	Water Table	
#44	1.9	1.7	0.7	0.7	0.7	Pervious Layer @ 2'		HIGH 0.6-2.0
#66								

III. DETERMINATION OF WEIGHTED CONSUMPTIVE USE (CU)

Crop	Acres (A)	June		July		August	
		CU	AxCU	CU	AxCU	CU	AxCU
<u>Alfalfa</u>	<u>40</u>						
Weighted Consumptive Use							

IV. WATER MANAGEMENT INFORMATION

Crop	Root Zone Depth (ft)	Total WHC (Inches)	Stress Point (%TWHC)	Max. Net Replacement (Inches)	Peak Daily C.U.	Max. Freq. @ Peak C.U. @ Max. Net.
<u>Alfalfa</u>	<u>5</u>	<u>5.7</u>	<u>50</u>	<u>2.85</u>	<u>.28</u>	<u>10</u>

V. DESIGN DATA -

Based on weighted consumptive use, 65% Eff., _____ MPH winds, _____ Wind Factor
(Ref: NHCP 442-2)

	Application		Peak Daily C.U. * (Weighted)	Frequency (F) (Days)	System Requirements	
	Net (D)	Gross			(Total gpm) (Q)	gpm/ac
Maximum	<u>2.85</u>	<u>4.38</u>	<u>0.28</u>	<u>10</u>	<u>345</u>	<u>8.6</u>

(40)(2.85)
Q = 453 A D = system capacity
F H Eff.
(10)(23)(.65)
H = Total operating hours/day

* Use controlling weighted monthly
consumptive use and determine peak
daily consumptive use from Table
ID683-3, page ID683-22.