

# Irrigation FACTSHEET



BRITISH  
COLUMBIA

Ministry of Agriculture, Food and Fisheries

Order No. 550.000-1

Agdex: 753

February 1985

## PREPARING A FARM IRRIGATION PLAN

The design and installation of a good irrigation system requires information on soils, crops, climate, water supply and topographical field data.

### REASONS FOR AN IRRIGATION PLAN

- A project plan enables the designer to lay out the irrigation system in the most cost effective way. The plan is used to generate a material list and to evaluate the anticipated project costs.
- The plan provides step by step information on system installation. Information on crop spacing, sprinklers, pumping requirements, pipeline sizes and lengths should be included on the plan. Pertinent obstructions such as roads, trees, gas, oil, water, telephone or transmission lines must also be indicated.
- Specification, design standards and work schedules as set out on a plan form the basis of any contractual agreements between the installation contractor and the farmer.
- The plan provides a record for future reference. It can be used for overall farm planning and identifies limits of expansion potential.

The irrigation plan should be passed on to subsequent landowners.

### ESSENTIAL FEATURES OF A PLAN

- **Topographic Data**  
The field shape must be accurately drawn showing pertinent obstructions, features and elevation details.
- **Water Source Capacity**  
The water supply must be clearly indicated showing location and available capacity. **Depending on the water source, a well log or water licence must accompany the irrigation plan.** Irrigation reservoirs also require Water Management Branch licensing.
- **Soil and Crop Characteristics**  
Soil and crop limitations must be accounted for to reduce runoff and deep percolation by mismanagement of the irrigation system.
- **Design Parameters**  
Soil water holding capacity, maximum application rate and climatic data must be used to select the correct irrigation system design.
- **Design Data**  
The nozzle selected, operating pressure, discharge rate and sprinkler spacing must all be shown on the plan. The irrigation interval, set time, application rate and net amount applied must also be calculated.

# SPRINKLER IRRIGATION DESIGN INFORMATION

## SOILS REPORT

Name \_\_\_\_\_

	PIT A		PIT B		PIT C	
Crop Root Depth (in)	_____		_____		_____	
Soil Depth (in)	Texture	AWSC (in/ft)	Texture	AWSC (in/ft)	Texture	AWSC in/ft)
0 - 12 in	_____	_____	_____	_____	_____	_____
12 - 24 in	_____	_____	_____	_____	_____	_____
24 - 36 in	_____	_____	_____	_____	_____	_____
36 - 48 in	_____	_____	_____	_____	_____	_____
Total AWSC (in)	_____		_____		_____	
Max Applic. Rate (A.R.) (in/hr)	_____		_____		_____	

### DESIGN PARAMETERS

Crop..... \_\_\_\_\_ ft  
 Root depth..... \_\_\_\_\_ ft  
 Soil type..... \_\_\_\_\_  
 Total available water storage capacity (AWSC)..... \_\_\_\_\_ in  
 Usable amount of water (\_\_\_\_% AWSC)..... \_\_\_\_\_ in  
 Maximum application rate (AR)..... \_\_\_\_\_ in/hr  
 Evapotranspiration rate (ET)..... \_\_\_\_\_ in/day  
 Water source (gpm available)..... \_\_\_\_\_ gpm

### DESIGN DATA

Interval..... \_\_\_\_\_ days  
 Set time..... \_\_\_\_\_ hours  
 Gross applied per irrigation..... \_\_\_\_\_ in  
 Net applied @ \_\_\_\_% efficiency..... \_\_\_\_\_ in  
 Application rate..... \_\_\_\_\_ in/hr  
 Spacing..... \_\_\_\_\_' x \_\_\_\_\_'  
 Nozzle..... \_\_\_\_\_ x \_\_\_\_\_  
 Pressure at the nozzle..... \_\_\_\_\_ psi  
 Gallons per minute per nozzle..... \_\_\_\_\_ gpm

### MAINLINE FRICTION LOSS CALCULATION

x - x \_\_\_\_\_' - \_\_\_\_\_" @ \_\_\_\_\_ gpm - \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ psi  
 x - x \_\_\_\_\_' - \_\_\_\_\_" @ \_\_\_\_\_ gpm - \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ psi  
 x - x \_\_\_\_\_' - \_\_\_\_\_" @ \_\_\_\_\_ gpm - \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ psi  
 x - x \_\_\_\_\_' - \_\_\_\_\_" @ \_\_\_\_\_ gpm - \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ psi  
 x - x \_\_\_\_\_' - \_\_\_\_\_" @ \_\_\_\_\_ gpm - \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ psi  
 x - x \_\_\_\_\_' - \_\_\_\_\_" @ \_\_\_\_\_ gpm - \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ psi  
 x - x \_\_\_\_\_' - \_\_\_\_\_" @ \_\_\_\_\_ gpm - \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ psi  
 x - x \_\_\_\_\_' - \_\_\_\_\_" @ \_\_\_\_\_ gpm - \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ psi

**Total Friction Loss in Mainline** \_\_\_\_\_ psi = \_\_\_\_\_ ft

### TOTAL HEAD REQUIRED

Pressure required at start of lateral @ \_\_\_\_\_ psi \_\_\_\_\_ ft  
 Total friction loss in mainline..... \_\_\_\_\_ ft  
 Elevation..... \_\_\_\_\_ ft

Suction lift or pump setting in well..... \_\_\_\_\_ ft  
 Miscellaneous losses..... \_\_\_\_\_ ft

**Total Head Required** \_\_\_\_\_ ft

### PUMP SPECIFICATIONS

Total head required..... \_\_\_\_\_ ft  
 Total gpm required..... \_\_\_\_\_ gpm  
 Minimum pump efficiency..... \_\_\_\_\_ %  
 Model (to be filled in by dealer) \_\_\_\_\_

### HORSEPOWER REQUIRED

H.P. =  $\frac{\text{ft} \times \text{gpm}}{3960 \times \%}$  = \_\_\_\_\_ hp

- **Mainline and Lateral Layout**

All mainline and lateral locations and sizes should be shown. Calculations of pipeline lengths and corresponding friction losses should be indicated on the plan.

- **Pump Specifications**

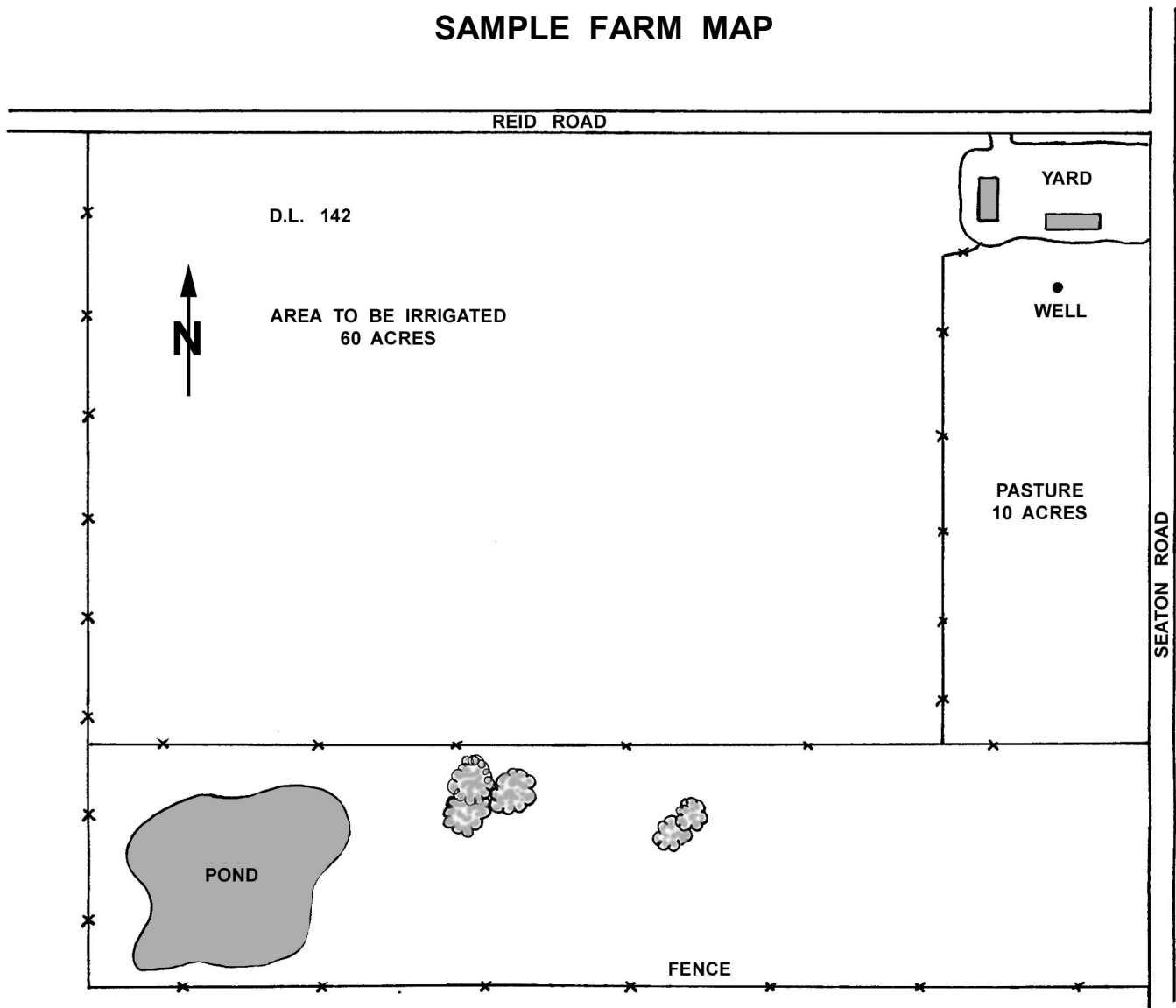
The pump horsepower requirements must be calculated from the total dynamic head and maximum system flow rate. The total dynamic head calculations must include system operating pressure, elevation differences and all friction losses.

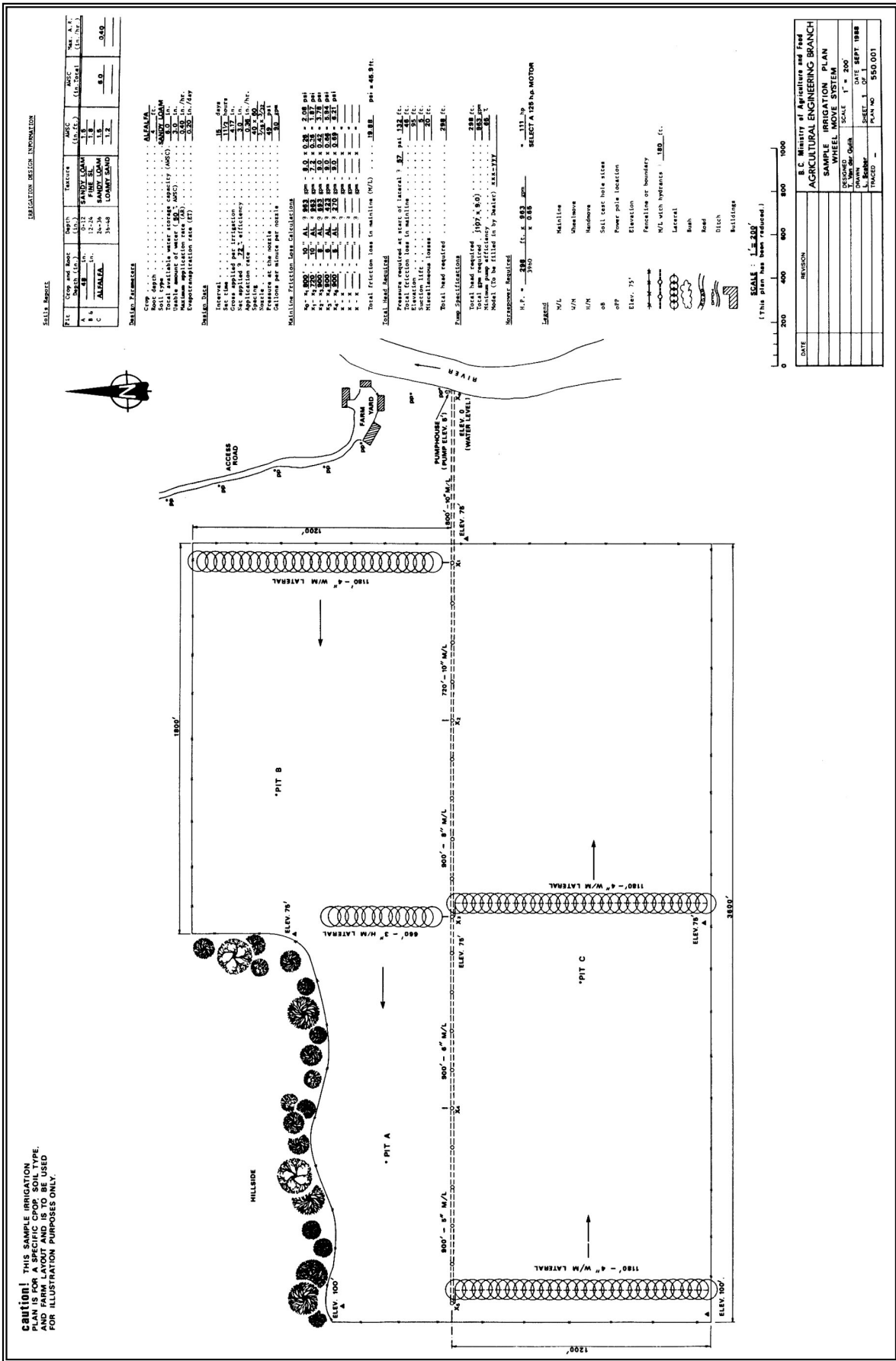
## WHERE TO OBTAIN A PLAN

A farm irrigation plan can be obtained from irrigation engineering consultants as well as reputable irrigation equipment dealers. An [irrigation equipment dealers list](#) is available from the Ministry of Agriculture and Food, Resource Management Branch.

The features of a farm irrigation plan are summarized in the sample “[Sprinkler Irrigation Design Information](#)” sheets attached. A sample of an irrigation design plan is also included. For further information on preparing a farm irrigation plan, see the “[BC Sprinkler Irrigation Manual](#)”. This publication is available from BC Ministry of Agriculture and Food.

## SAMPLE FARM MAP





**FOR FURTHER INFORMATION CONTACT**

Ted Van der Gulik, Senior Engineer  
 Phone: (604) 556-3112  
 Email: Ted.Vandergulik@gems8.gov.bc.ca

**RESOURCE MANAGEMENT BRANCH**

Ministry of Agriculture and Food  
 1767 Angus Campbell Road  
 Abbotsford, BC CANADA V3G 2M3