

# APPENDIX 7

## Preliminary BMP Capital Cost Estimates Quantity and Combined Quantity & Quality Control

When a wet or dry detention structural BMP is proposed to meet the requirements of Chapter 30 Article VII Environmental Regulations, the following procedure may be used to determine the preliminary construction costs. The preliminary construction cost is used as the basis for establishing the amount of surety that must be posted whenever an initial CO or final plat recordation is requested prior to BMP certification.

Preliminary estimates of capital costs of storm water ponds (water quantity and/or quality) are presented in the attachments for the following cases.

1. Ponds **inside** the Water Supply Watersheds
  - Cost of **wet detention ponds** without peak runoff control (Water Quality Control only)
  - Cost of **wet detention ponds** with peak runoff control (Water Quality and Quantity control)
  
2. Ponds **outside** the Water Supply Watersheds
  - Cost of **dry detention ponds** for peak runoff control (Water Quantity Control only)
  - Cost of **wet detention ponds** with peak runoff control (Water Quantity and Quality control)

**In the Water Supply Watersheds**, the incremental cost of providing for peak runoff (Quantity) control (in addition to the required water quality control storage), is approximately 17% of the base cost of the water quality wet pond.

**Outside the Water Supply Watersheds**, the incremental cost of providing for Quality control (in a wet detention pond) is approximately 45% of the base cost of peak runoff (Quantity) control in a dry detention pond.

### Cost Estimate Methodology

Pond storage volumes ( $V_s$ ) required for the different cases stated above were estimated based on Guilford County's "Water Quality Protection Manual" and data from selected projects in Greensboro. Capital Cost (CC) estimates for the required storage ( $V_s$  in cubic feet) in the ponds were then derived by using a formula (with a suitable adjustment to the constant in the formula) presented in a paper by the Center for Watershed Protection based on studies of a number of ponds in the Mid-Atlantic region:  $CC = 30 (V_s)^{0.7}$ . The cost estimate includes engineering and administration costs.

To determine the preliminary capital cost estimate perform the following:

1. Determine whether the BMP is located inside or outside the City of Greensboro watersupply watershed.
2. Determine the amount of drainage area and BUA to the BMP.
3. Locate the appropriate curve with the information gathered from the first two steps. Using the amount of drainage area as the entering argument read up until you intersect the curve that represents the BMP to be constructed (water quality only, quality and quantity combined or quantity only). Read across to obtain the preliminary capital cost estimate. For development with BUA values that do not fall directly on a plotted curve perform one of the following:
  - a. Use the plot representing the next highest BUA value from the development proposed or
  - b. Interpolate between the two plots that bracket the BUA value for the development proposed

### Cost Escalation Determination

To provide a method for escalating the cost of BMP construction due to inflationary factors the following approach should be used.

1. Determine the preliminary capital cost estimate in accordance with the procedure outlined previously. The resulting cost is to be used as a 2007 fiscal year baseline.
2. Using the U.S. Army Corps of Engineers Civil Works Construction Cost Index System (CWCCIS) located at <http://www.nww.usace.army.mil/cost/> and **Appendix A Table 2** Yearly Cost Indexes, find the composite cost index for reservoirs and dams (CWBS – Feature Code 03 and 04) in FY 2007 (baseline year) and the year construction is proposed.
3. Use the formula shown in the example below to determine the escalated construction cost.

The following formula is used for the purpose of updating/escalating an existing project cost.

$$\frac{\text{Cost Index} - \text{Year A}}{\text{Cost Index} - \text{Year B}} \times \text{Cost in Year B (known)} = \text{Cost in Year A (Unknown)}$$

Cost Index A - Cost index for the Year the project costs are updated to.

Cost Index B - Cost index for the Year the project costs are updated from.

Example - Assume the following:

You have a wet detention pond cost of \$75,000

Date of the project cost is FY 2007 (baseline year)

Feature Code is a composite of 03 - Reservoirs and 04 - Dams – Cost Index (for FY 2007) is the average of 700.34 and 663.57 or **681.96**

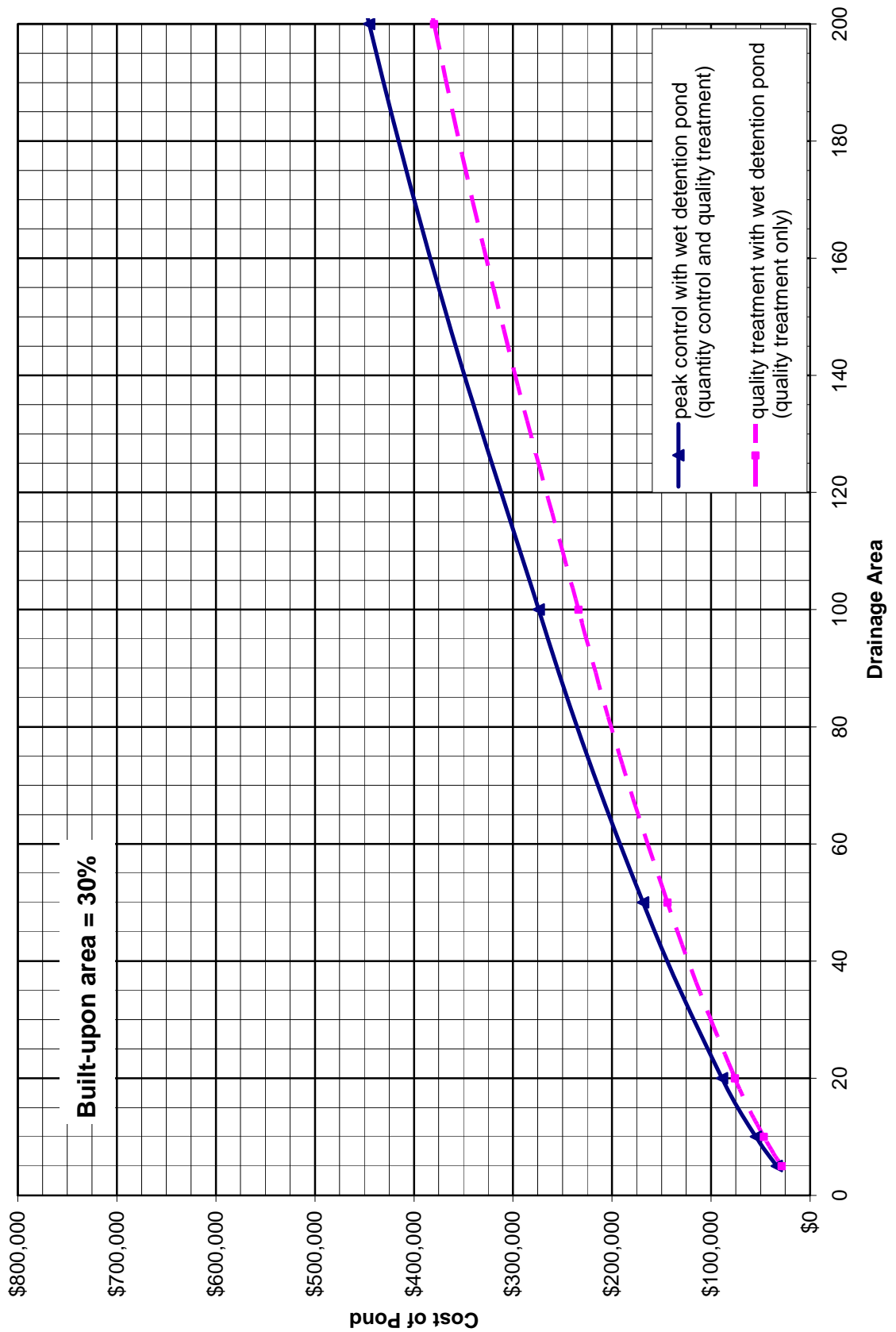
You want to escalate the project cost to FY 2009

Feature Code is a composite of 03 - Reservoirs and 04 - Dams – Cost Index (for FY 2009) is the average of 731.65 and 694.76 or **713.21**

$$\frac{713.21}{681.96} \times \$75,000 = \mathbf{\$78,437}$$
 in FY 2009

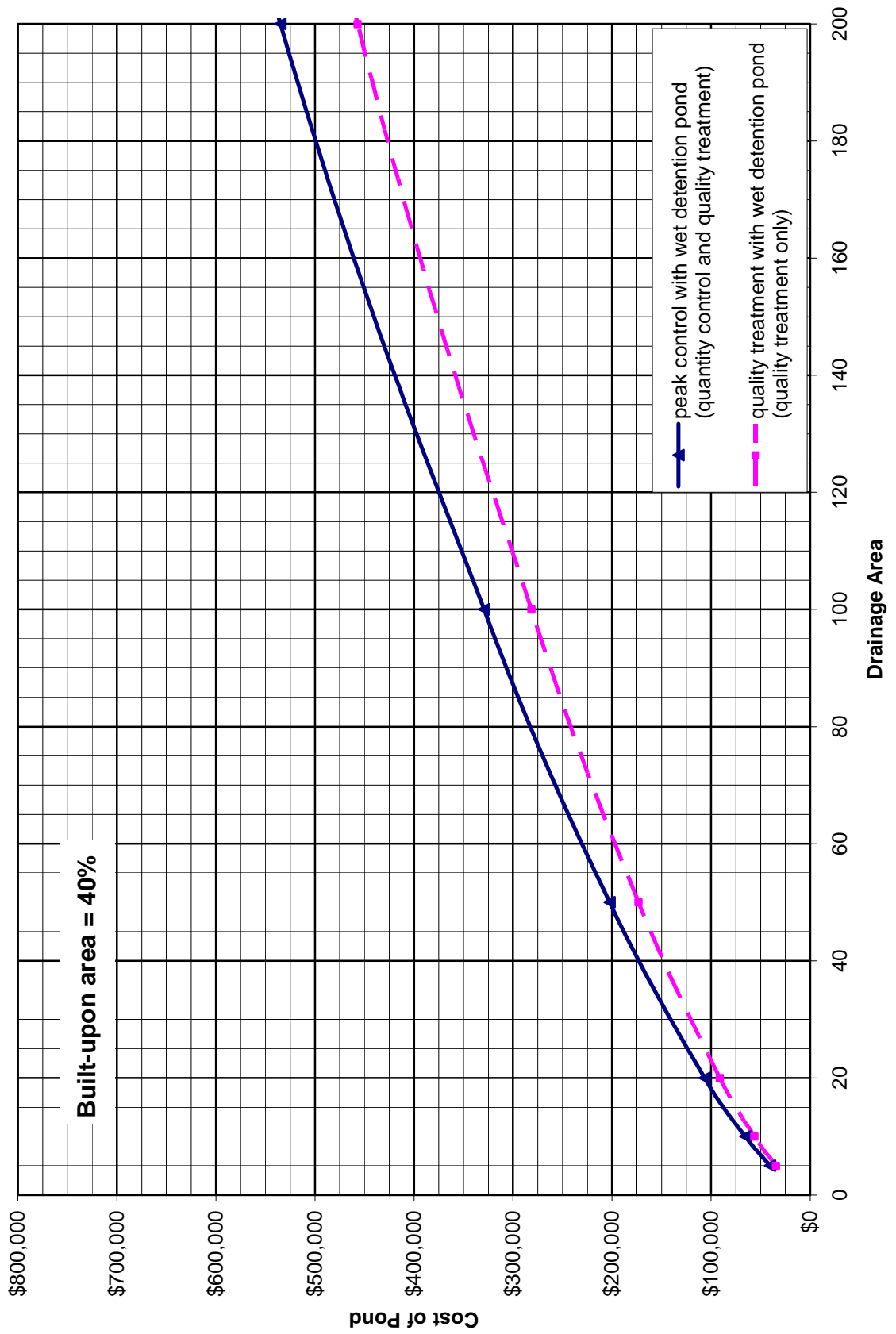
# Preliminary Estimate of Capital Costs for Ponds

Pond options inside water-supply watershed areas



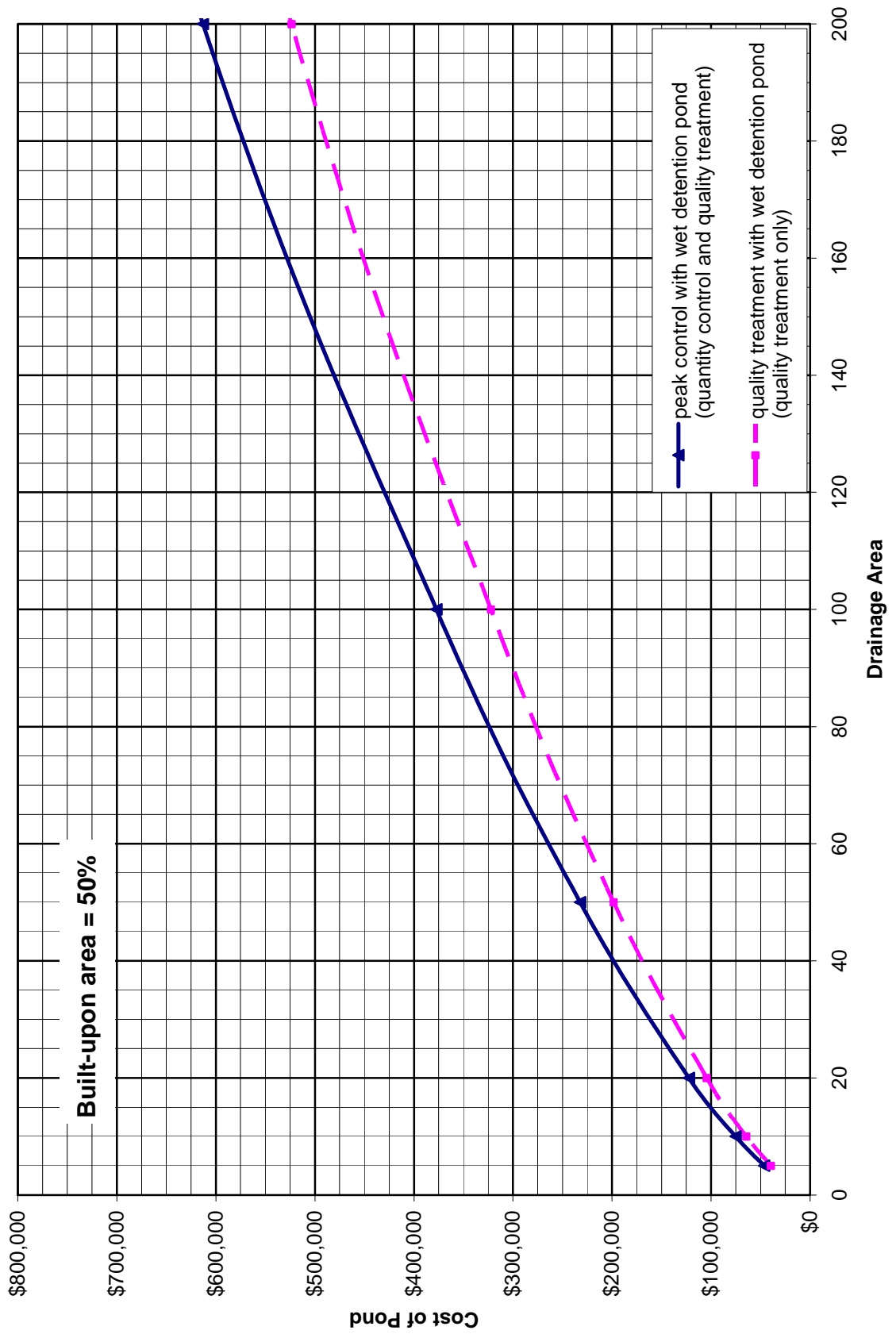
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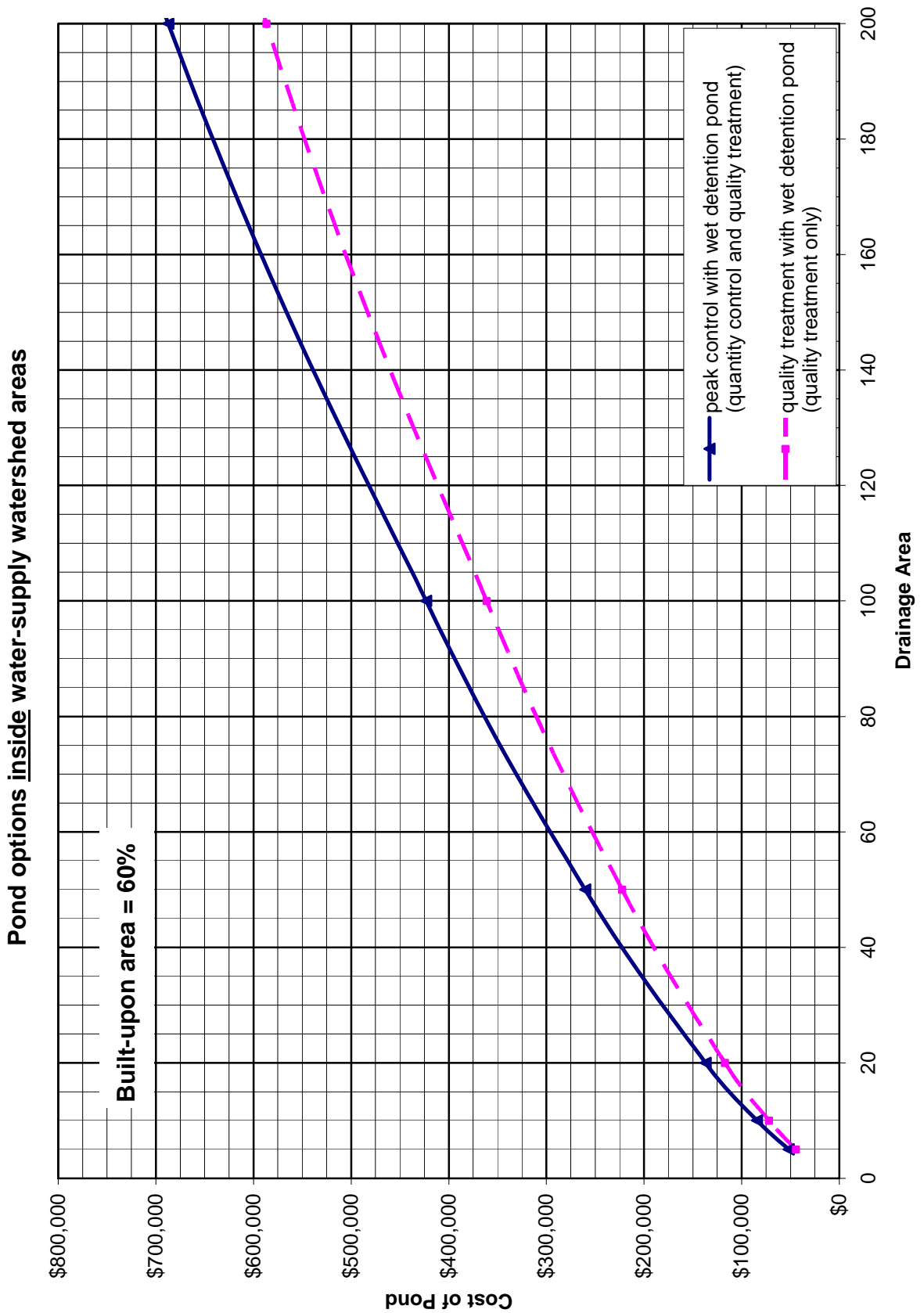


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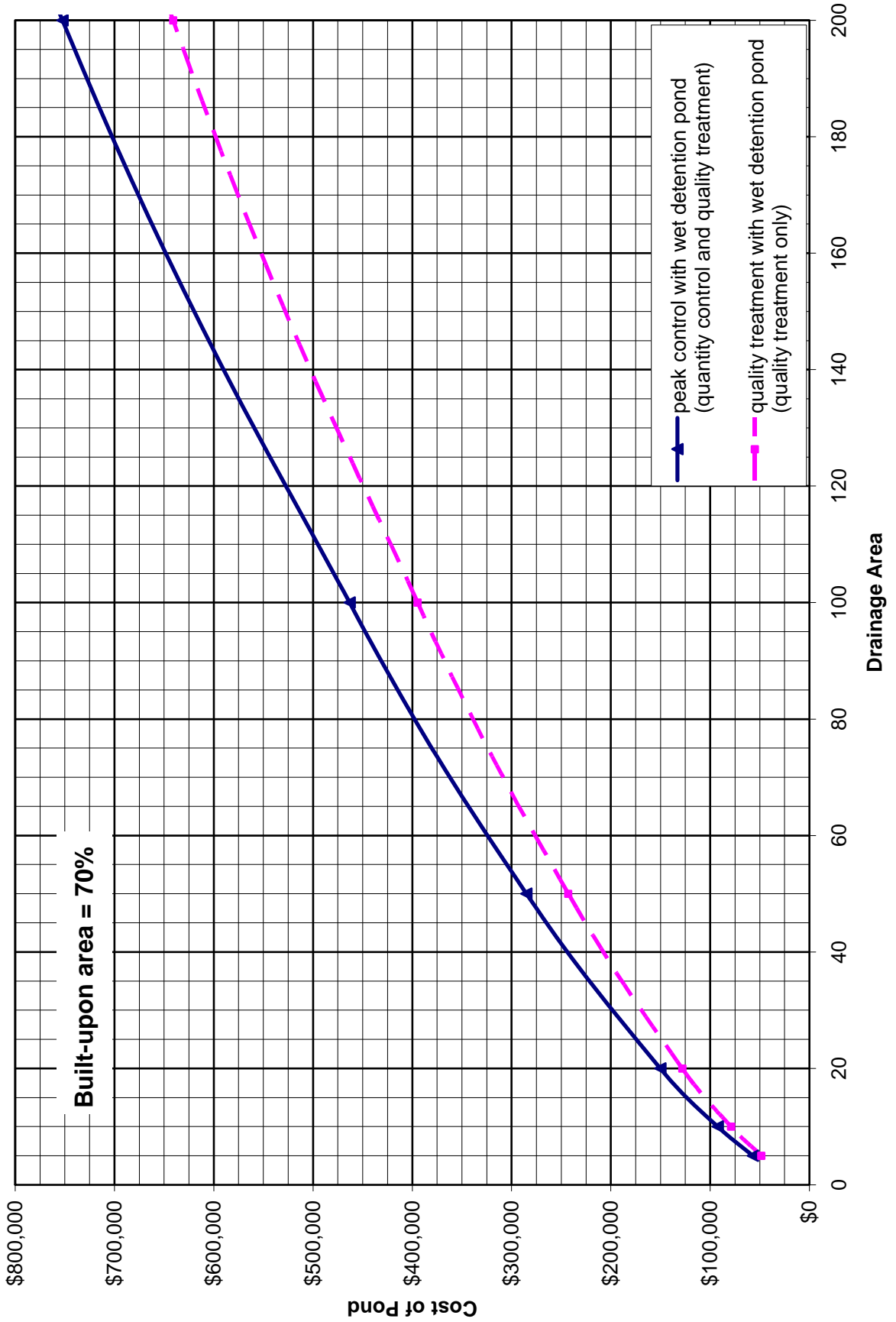


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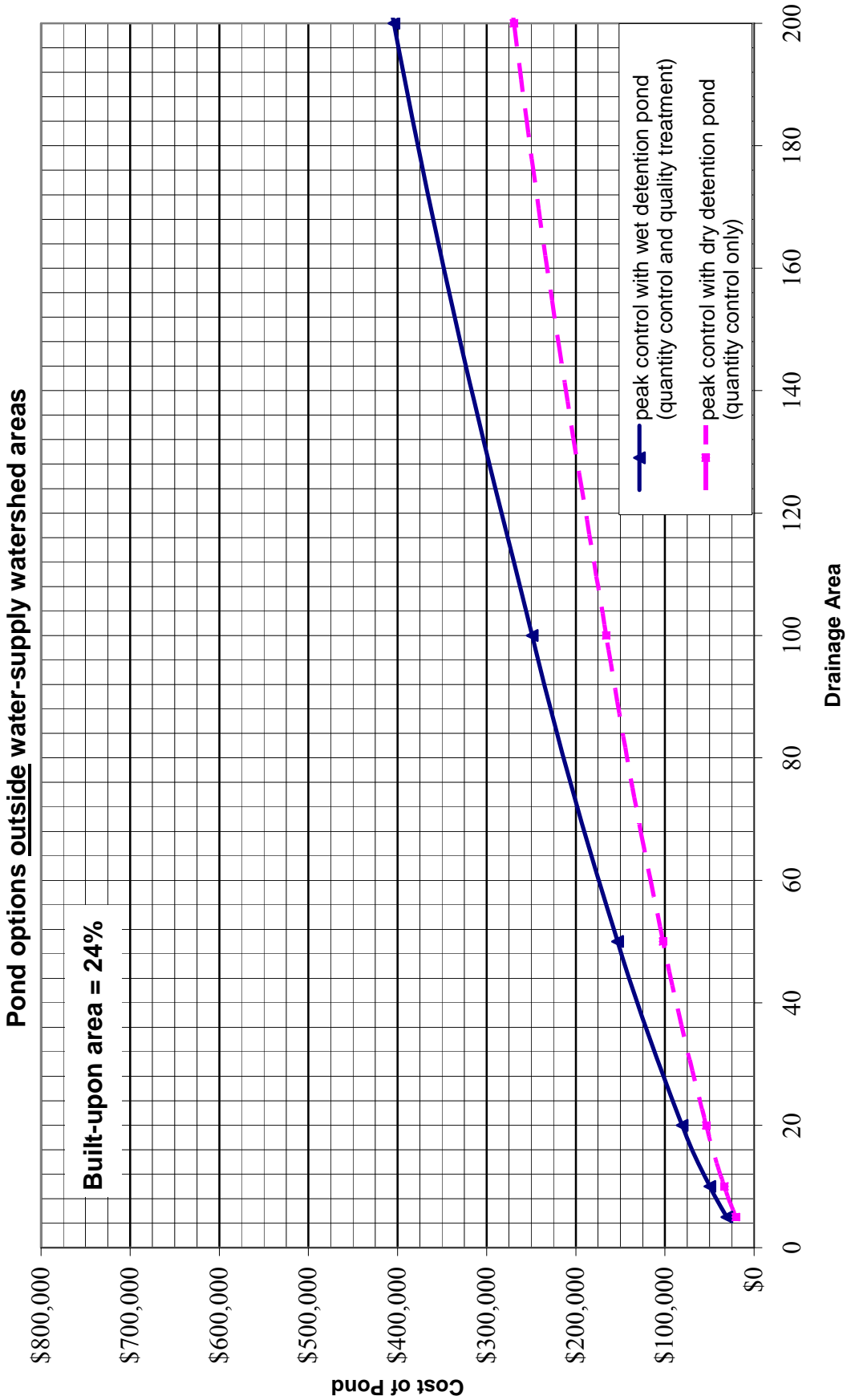
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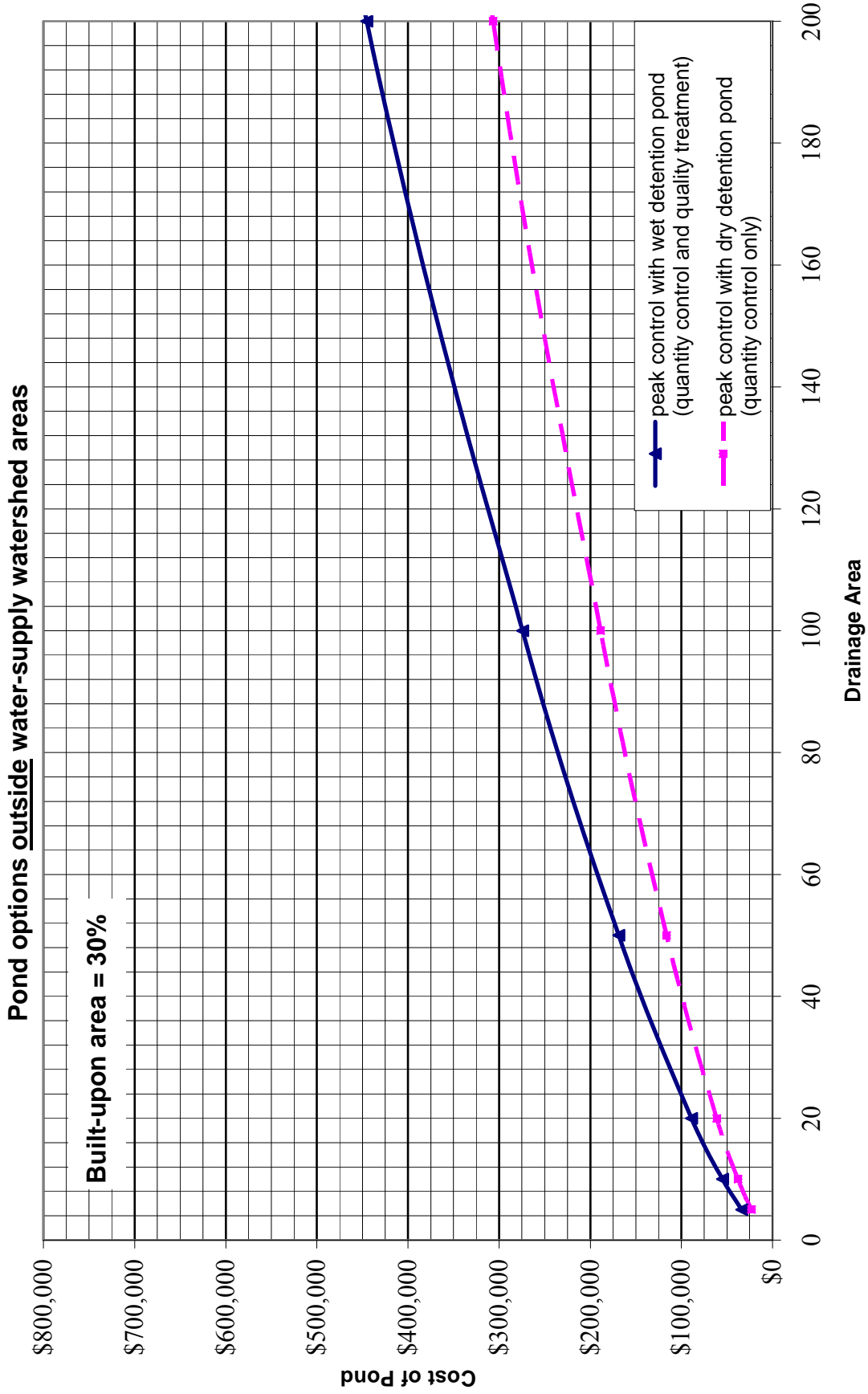




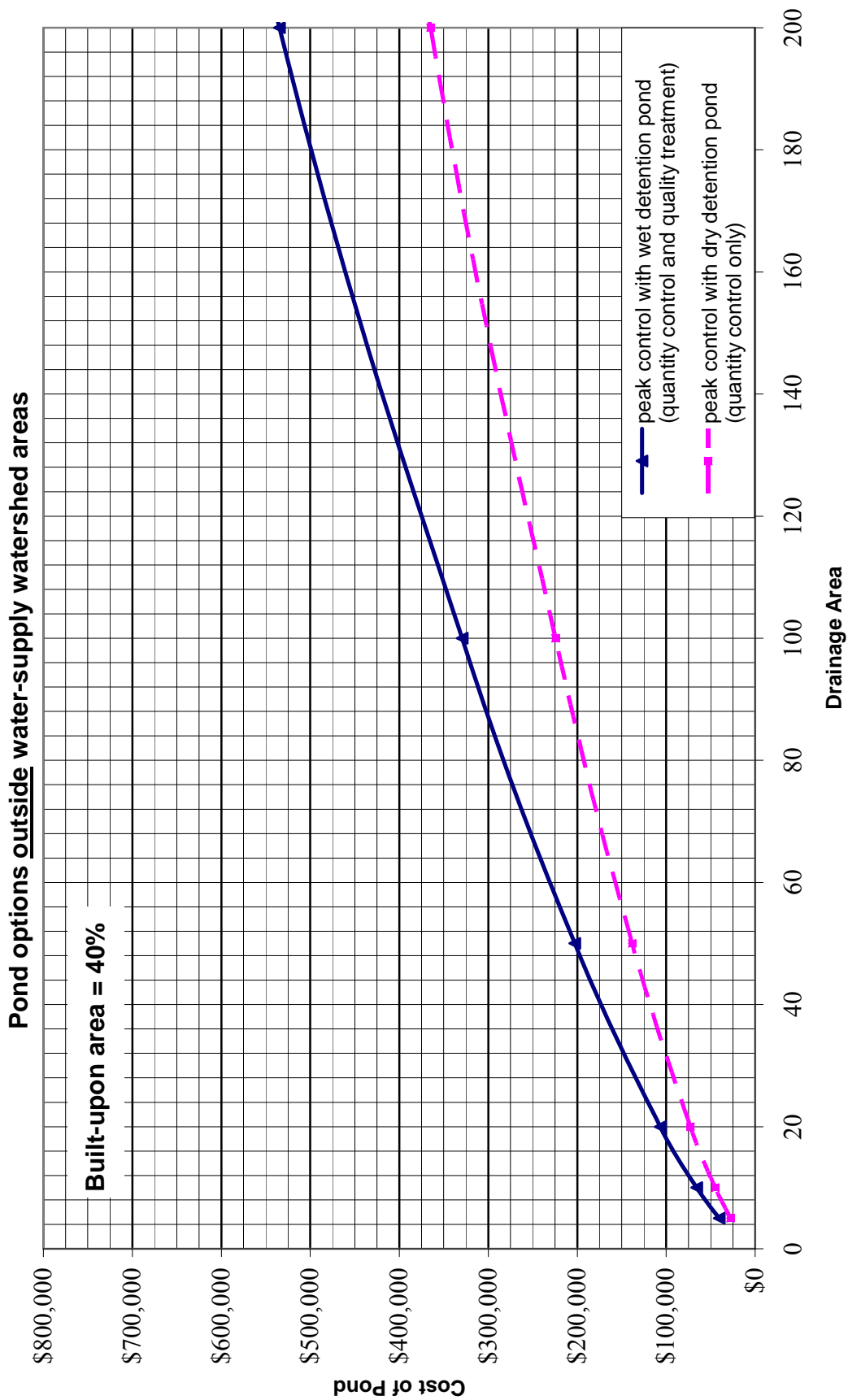
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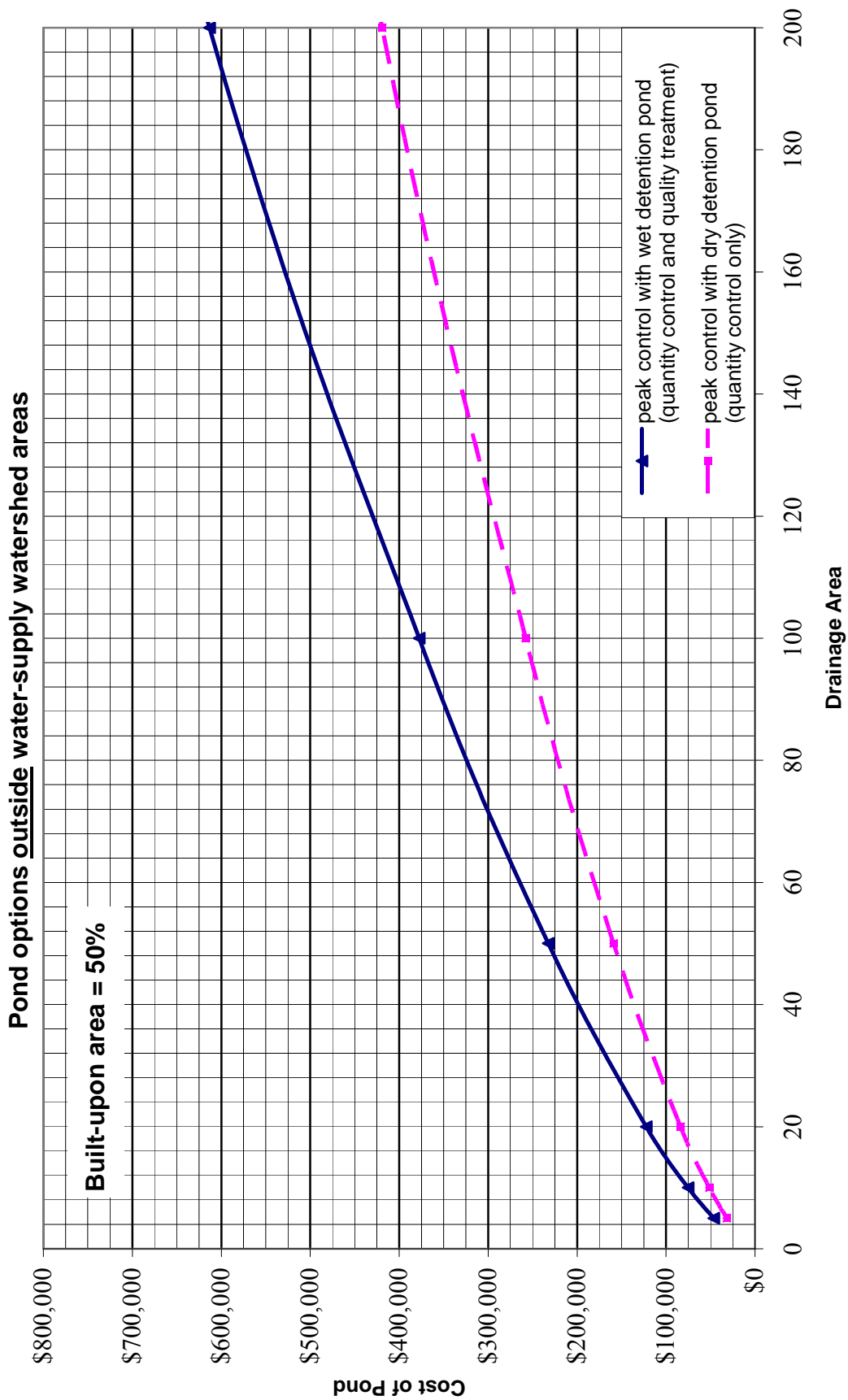
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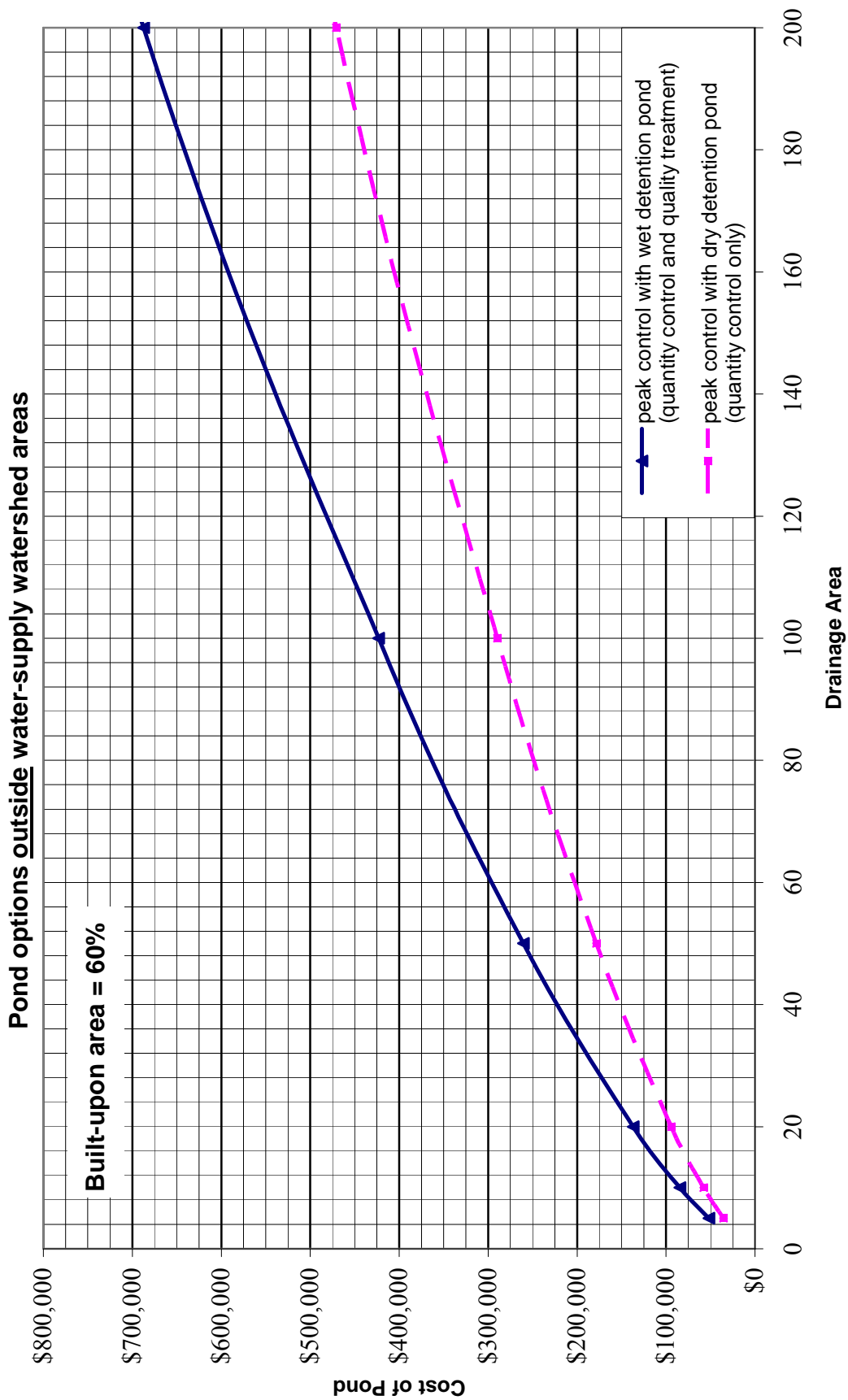
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