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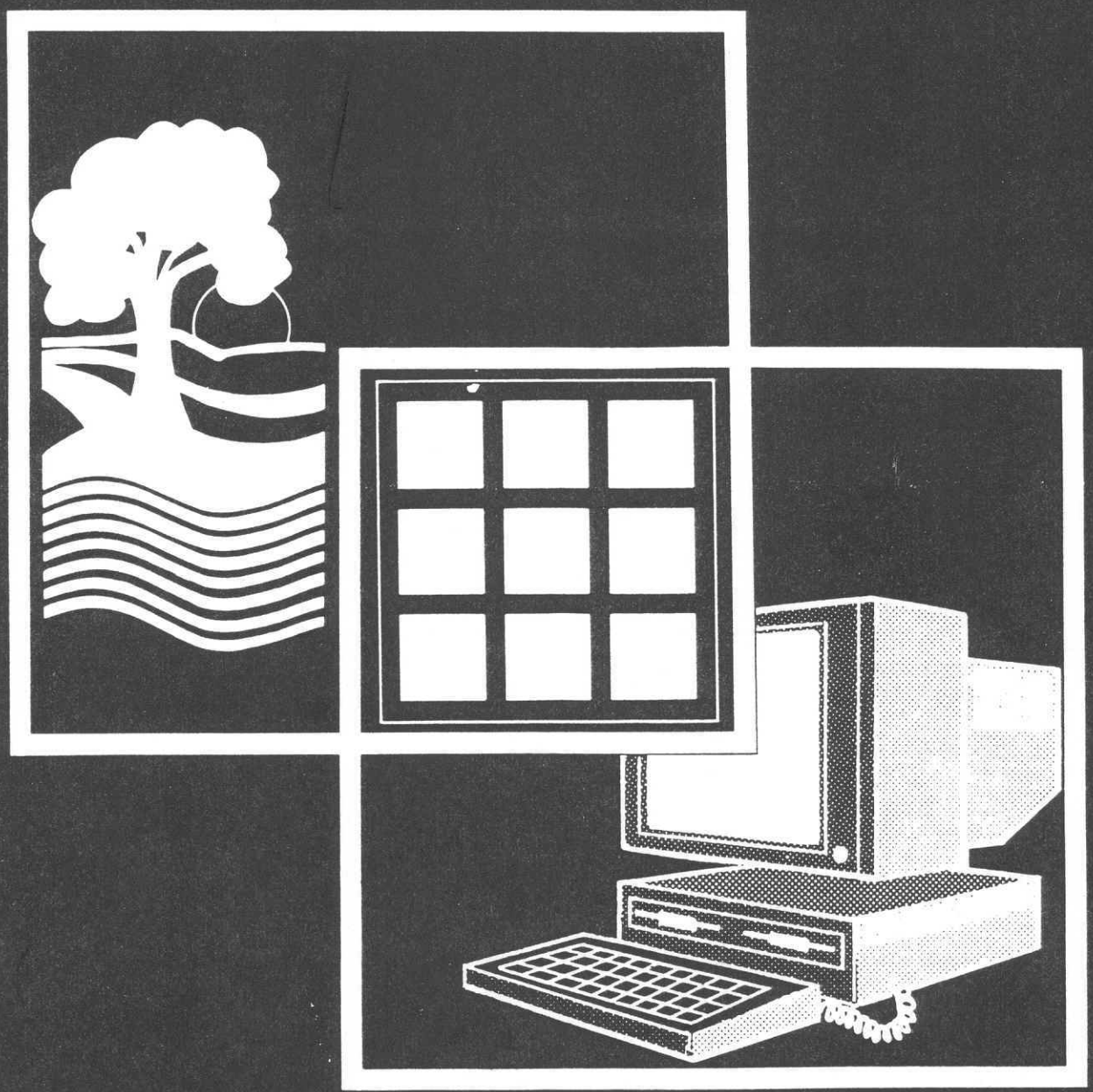

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Boylegraphics: An application of a graphics data base management system

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ABSTRACT

A Graphics Data Base Management System is developed for use with computerized Master Plans of Drainage and Storm Water Plans. The Storm Water Plans are prepared according to particular governing agency specifications involving multiple hydrologic and hydraulic modeling options, integrated into a single software package. Data bases are prepared for graphical representation of streets, land uses, hydrologic soil groups, rainfall, master plan system elements, topographic, and other data, as well as computational results developed from the Master Plan of Drainage computer model. Two applications are available; an integrated package enabling editing and upgrading of the Master Plan, and another package designed to publish and distribute the Graphics and the Master Plan of Drainage data bases to the public in an access-only data base retrieval environment. The opportunities provided by such public information programs are significant, in that the entire Master Plan becomes available to the public in an easy-to-read and easy-to-use environment. The public therefore becomes an integral and important member of the Master Plan team, exchanging input and easing the way for acceptance of the project.

Key Words: drainage, land use planning, software, storm water management, urban hydrology

SOFTWARE AVAILABILITY

Name of Software:

BoyleGraphics

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Year First Available: 1992

Cost: Project Basis

depending on conditions such as watershed size. In Southern California, several county flood control districts require use of two flood flow estimation techniques depending on catchment area. The rational method for areas smaller than about one square mile. The design storm unit hydrograph method for areas larger than about one square mile. The transition between techniques has been coupled into an integrated computerized Master Plan of Drainage model, for the first time, enabling the development of an integrated hydrologic computer model with one pass of the analysis, rather than two separate studies. As a result of coupling hydrologic techniques in a single computer model, a single system is available for use in preparing Master Plans of Drainage and upgrading the master plan, thereby greatly reducing the complexity, review and cost involved.

The Master Plan of Drainage software contains internal editing and computational elements that involve 152 hydraulic and hydrologic submodels and global modeling commands. The software enables analysis of an integrated open channel or closed conduit flood control

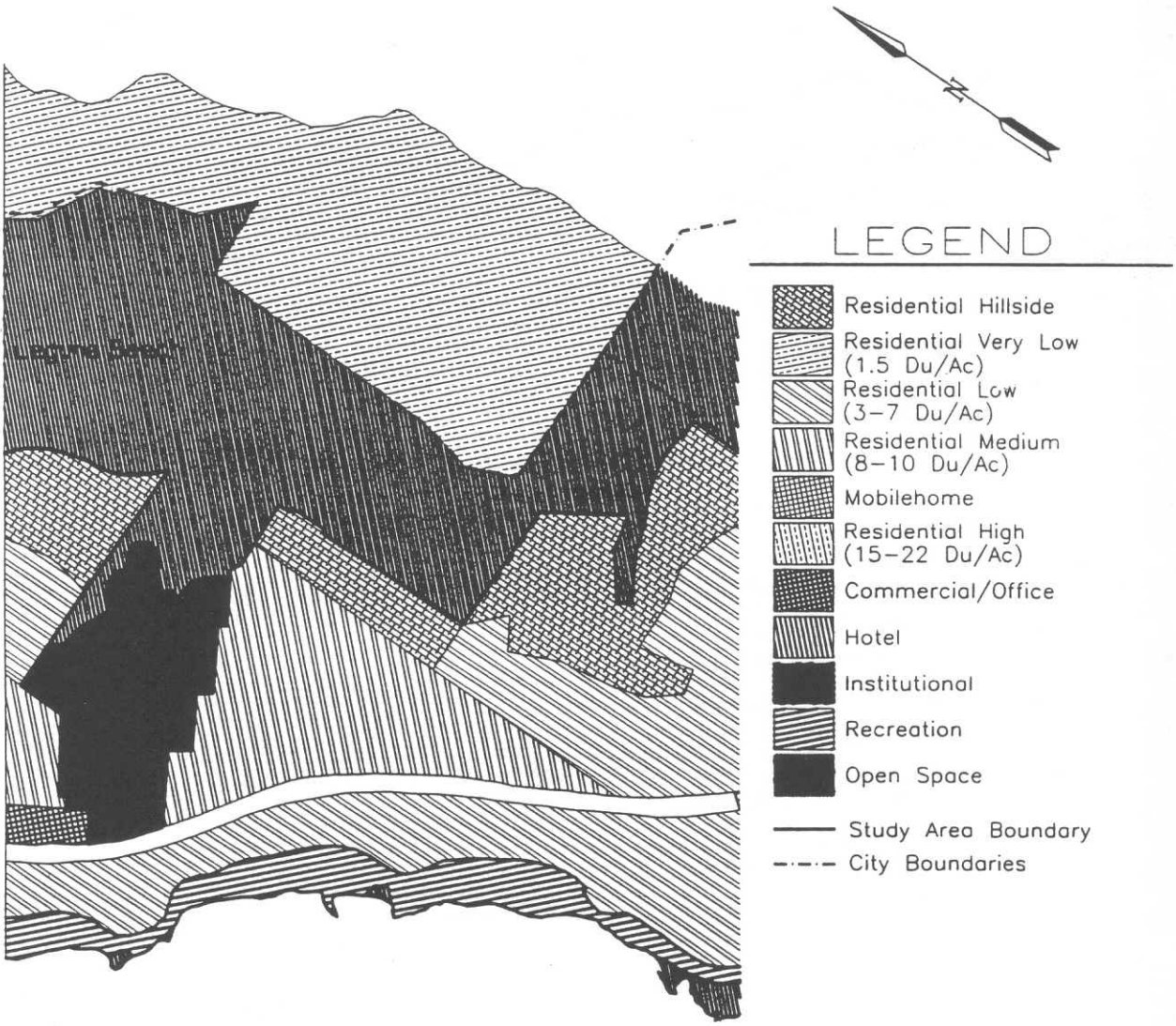

Fig. 1. Hydrology Land Use Map.

base construction. Geographic location is provided by use of street layout layers, right-of-way maps and freeway maps. The graphics data base is used to prepare hard-copy maps for reports, as well as graphical layers for display on the computer monitor. Figures 1 and 2 show hard copies of example graphical layers for a Master Plan of Drainage. Figure 1 depicts the land use map and Figure 2 depicts the hydrologic soil group map.

Polygon Processor

The use of geographic information systems (GIS) has become widespread in many facets of engineering and planning, among other fields. A key element of a GIS is the ability to intersect graphical layers so that several forms of information are resolved into "cells" wherein all parameters are constant. Figure 3 shows the several graphics layers of land use type, soil loss parameter type, hydrologic subareas, overlayed such as to show their polygon intersections.

In the Master Plan of Drainage, each subarea requires definition of land use, hydrologic soil group, rainfall subarea size, and the proportions of each within

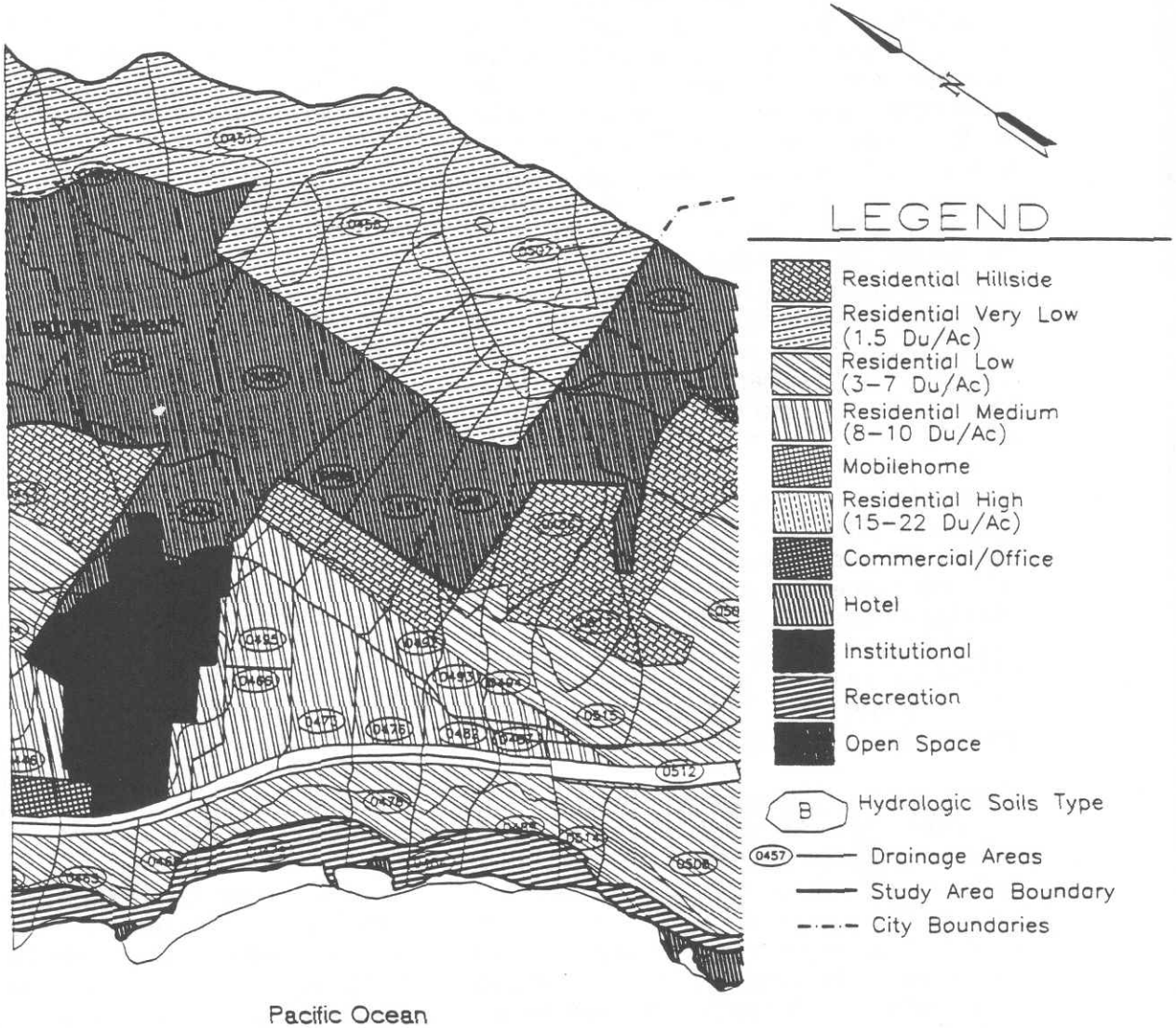

Fig. 3. Overlay of Land Use, Hydrologic Soil Group, and Subareas for Polygon Processing.

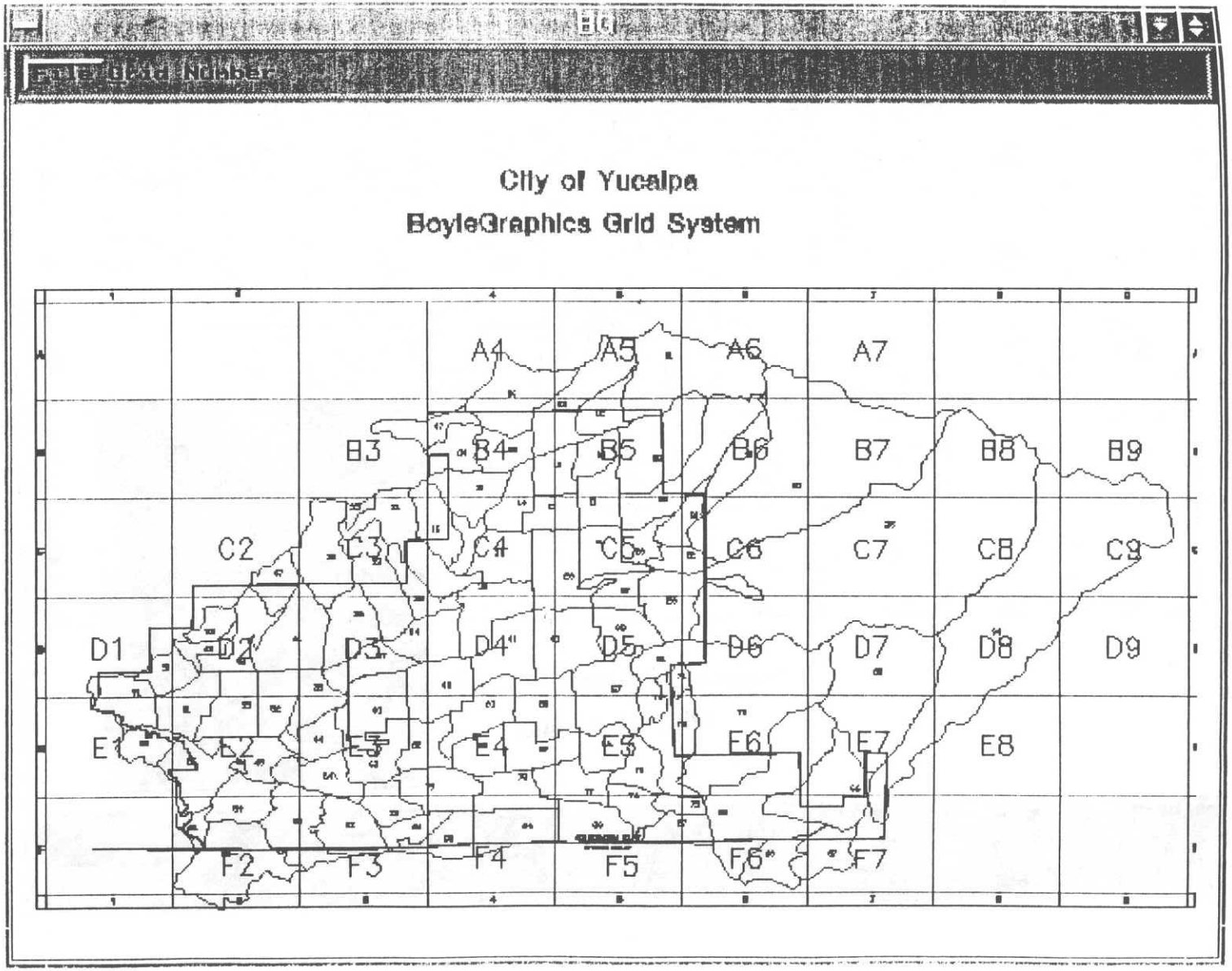

Fig. 4. Index Map for Example Application Showing Entire Study System With a Grid Background.

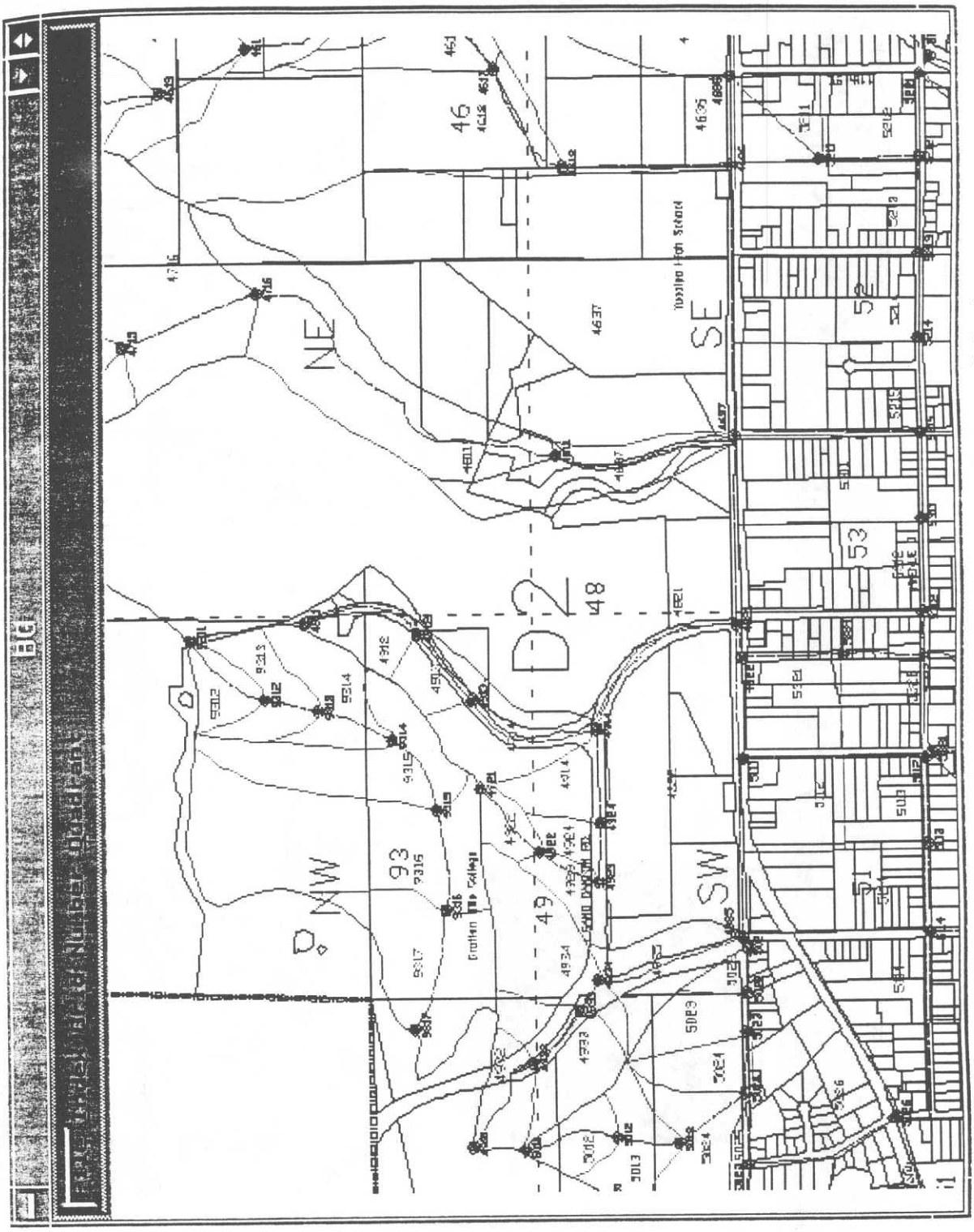

Fig. 6. A View of Grid D2. Note New Command Option.

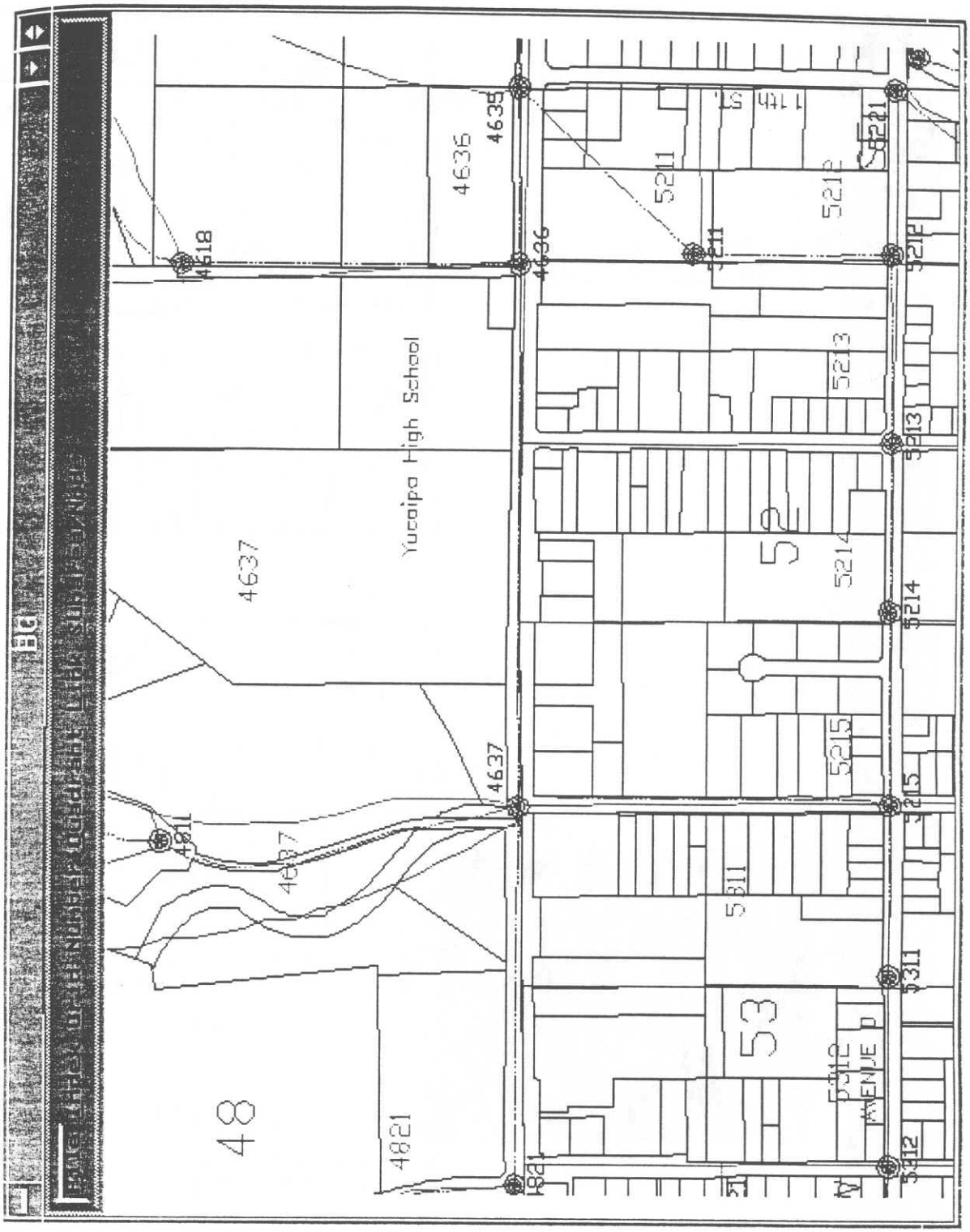

Fig. 8. A view of Quadrant SE of Grid D2. Note Data Base Display Options on Top.

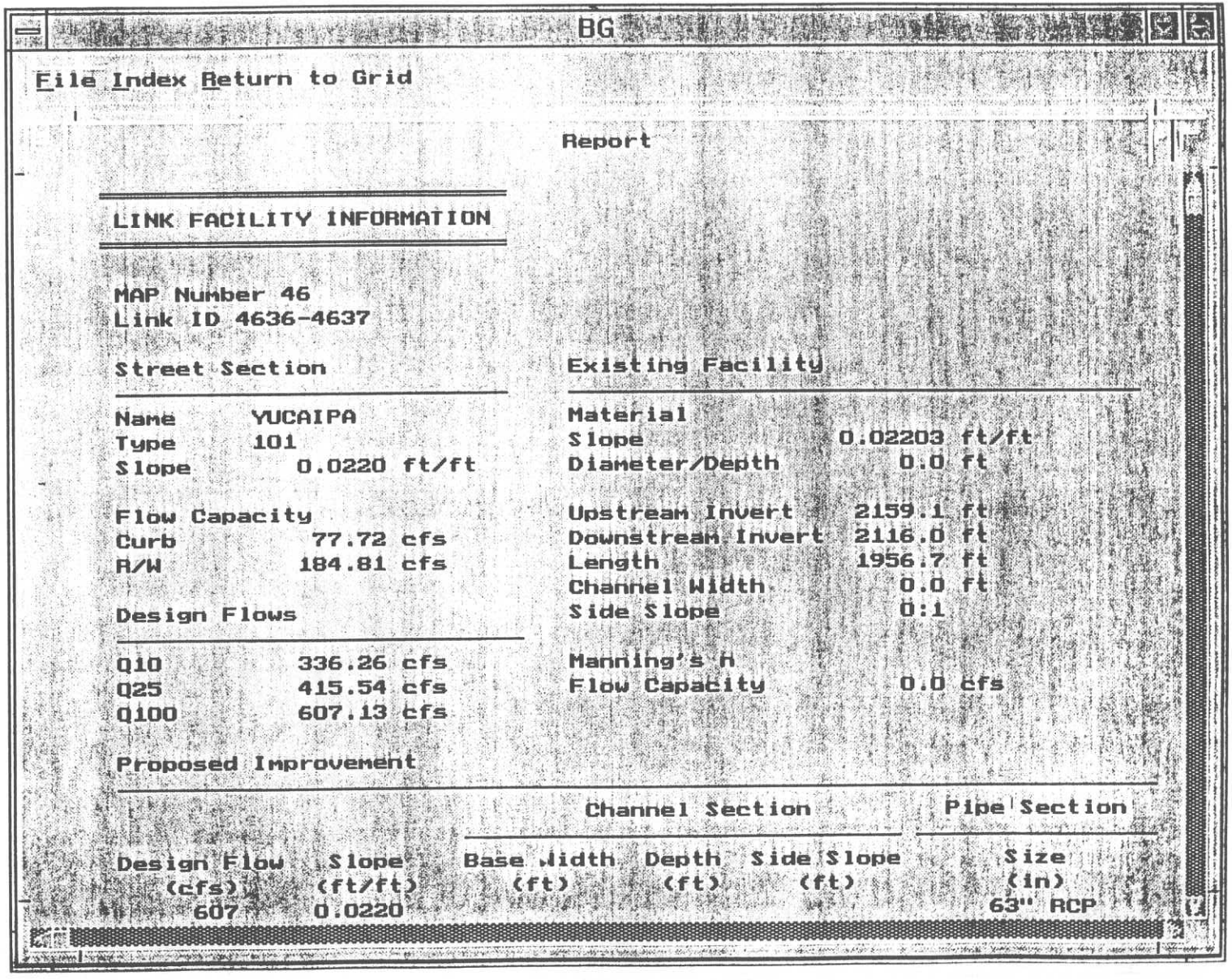

Fig. 10. Link 4636-4637 Data Display (of SE Quadrant of Grid D2).

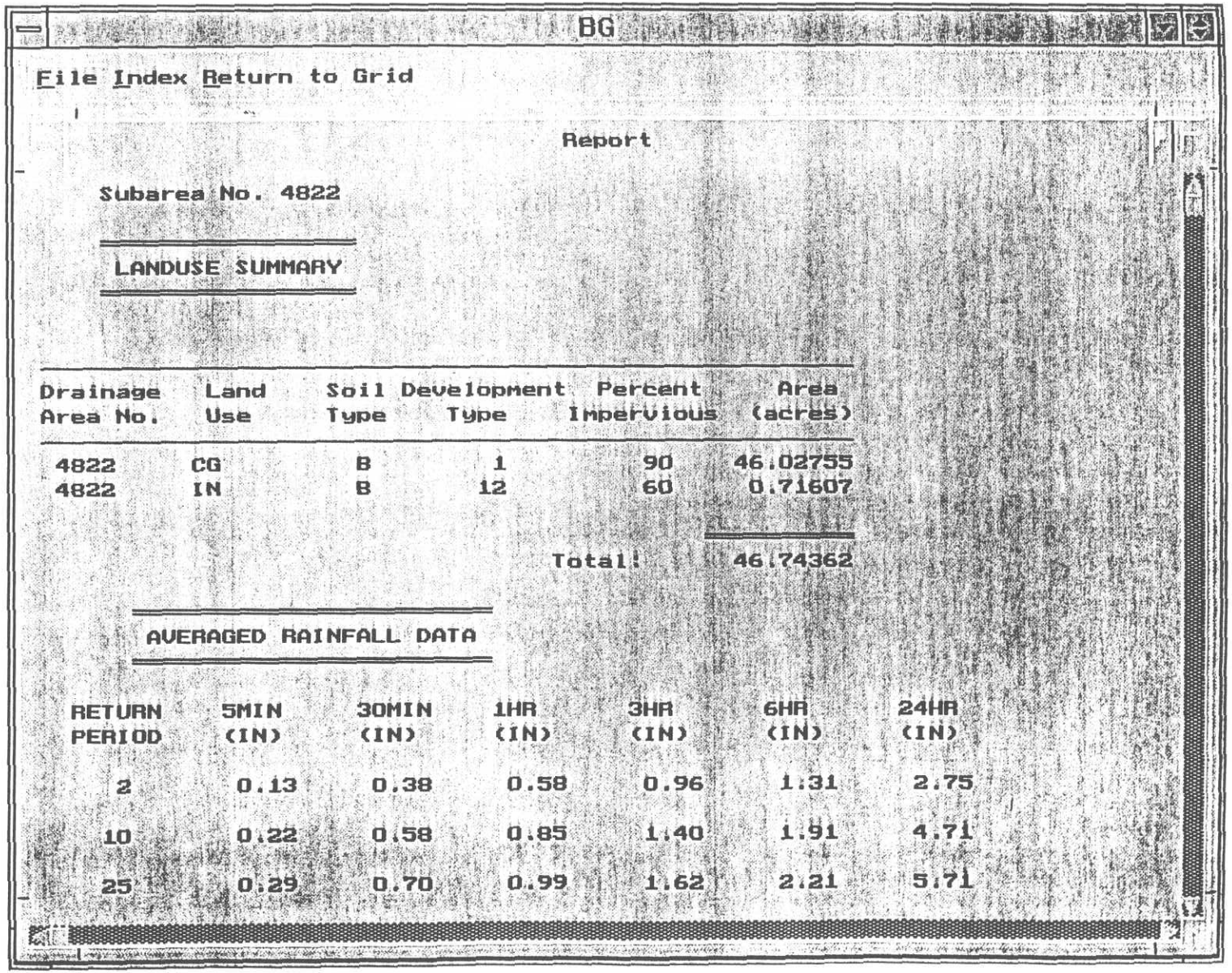

Fig. 12. Page 1 of Subarea/Node 4822 Data Display.

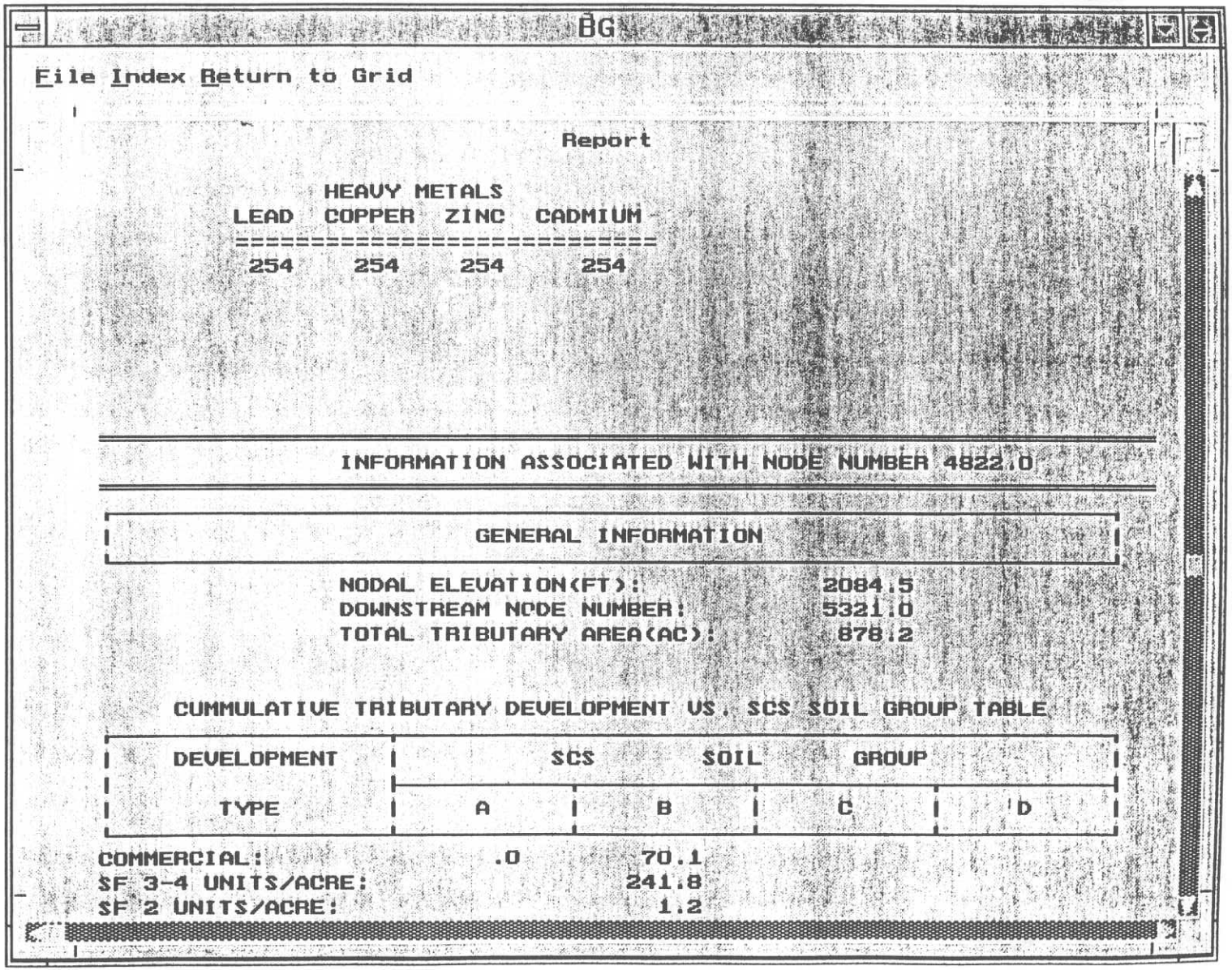

Fig. 14. Page 3 of Subarea/Node 4822 Data Display.

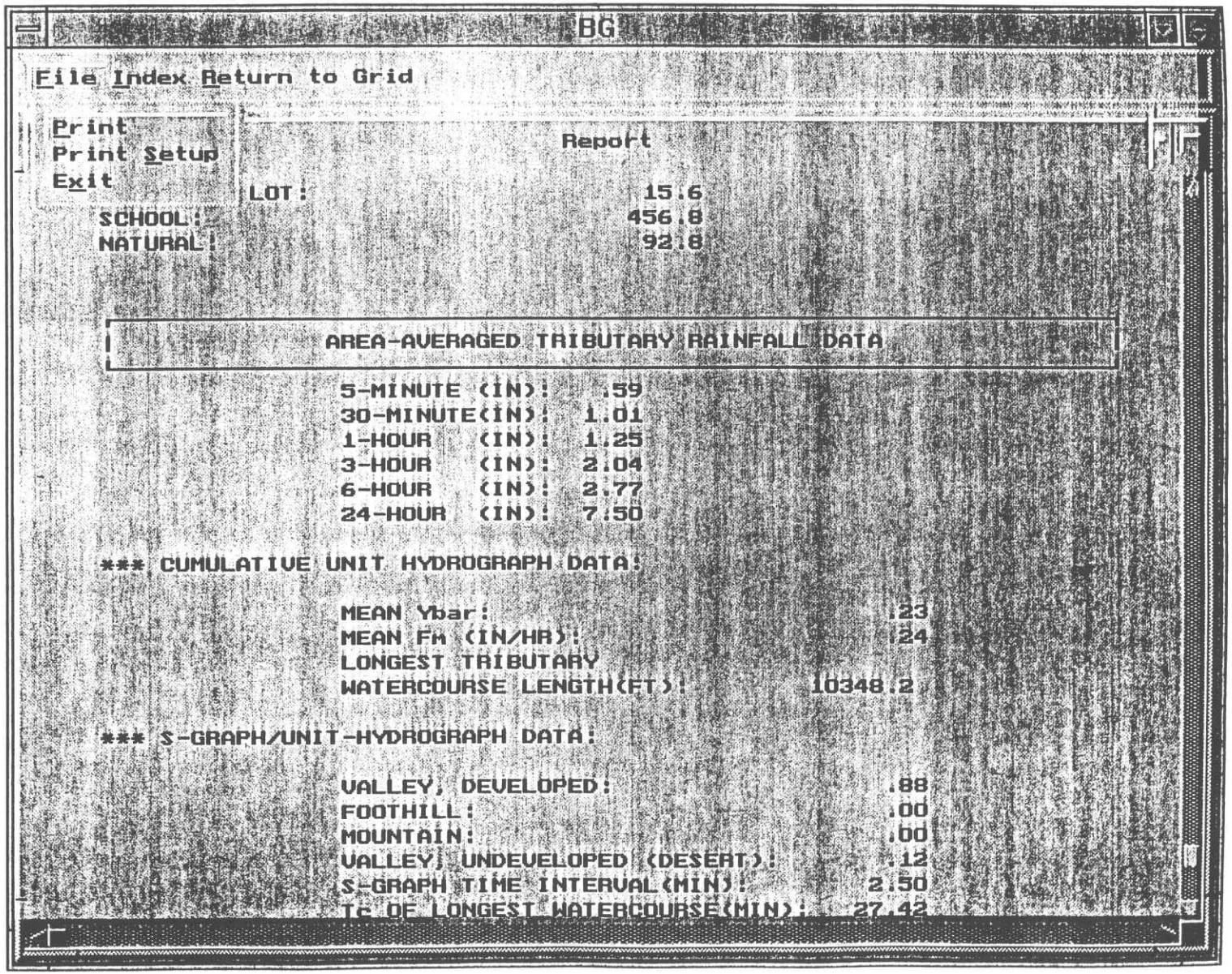

Fig. 16. Page 5 of Subarea/Node 4822 Data Display.

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