ACQUISITION, INTEGRATION, AND ARCHIVING OF CORE INFORMATION

John S. Campbell, ExxonMobil, Houston, Texas - USA
Charles L. Savoie, Norwest Labs, Calgary, Alberta - Canada

ABSTRACT

Digital photography and imaging technology has improved to such an extent today that capturing and integrating images from several data sources such as negatives, transparencies, and prints has become routine. Historical images can now co-exist with present day images and be retrieved without compromising the integrity of the images. Core information in a variety of formats and media such as core analyses (routine and special core analysis), core descriptions, mineralogy, catscans, and photographs can now be digitally captured, integrated, and archived in a useable format and in a central location easily accessible by both geoscientists and engineers. Figure 1 demonstrates the general process by which core images and data from ExxonMobil exploration wells are assimilated and integrated. Users throughout the world follow this process to ensure consistency and efficiency of use.

The primary advantages of digital imaging technology is to provide as much visual information as possible to the user in a fast and cost effective way. At a glance, the geologist or reservoir quality specialist can quickly verify grain size distribution, facies, and mineralogy. The petrophysicist or engineer can review routine core analyses, special core analyses (SCAL), and net pay (ultra-violet photography). This results in better integration of core data in both geologic and engineering studies and ensures the complete digital archiving of the data for future studies. This process will also allow quicker integration of the data and a more accurate interpretation by the geologist, engineer, and petrophysicist.

Data management has become a crucial part of the oil and gas industry. Paper copy reports and even digital files are easily lost or misplaced and are not easily accessible by all users of the data. Customizing the search and retrieval criteria and placing the data in a central readily accessible location creates a cost effective archival method.

In the digital image processing, merged core images are archived to Kodak Portfolio Photo CD's (in 5 different resolutions) and also printed and laminated into half-scale panels (see Figure 2). The merged core images along with other pertinent core data are assimilated into an integrated PDF template (see Figure 3) and loaded onto a dedicated LAN hard drive. ExxonMobil controls access to the LAN server and the data is made available to all users with proper permissions.

All identified users can access this information using Adobe Acrobat® , to navigate to any area of interest. Within the ExxonMobil designed Acrobat® , table of contents (bookmarks), a routine for launching specific core data (routine analysis, LPSA, facies data, etc.) to Excel has been incorporated. This launching technique permits the user to

back to contents

manipulate/analyze the data and/or incorporates the data into their own reports. Changes/additions to the Acrobat®, PDF file can only be made by authorized personnel, ensuring the master PDF LAN copy always remains unchanged.

Also, because Adobe Acrobat®, is a true windows based operation, the cut and paste functions are active. The user can quickly extract (copy and paste) any images and/or data from anywhere in the Acrobat®, table of contents and incorporate the extracted data into their own report or spreadsheet. This feature allows the user to truly depict a contact, or special pay interval, or a feature of interest in the data.

Digital imaging tools are critical to the success of today's geoscientists and engineers, who must characterize and quantify hydrocarbon reservoirs for fast-track production developments. Acrobat®, by Adobe Systems Inc. has been used successfully to accommodate the growing need to integrate/merge core information and images for ease of use. Acrobat®, files are now a de-facto standard for electronic file exchange and are by far the most versatile and easy to use for integrating data types and images.

Figure 1

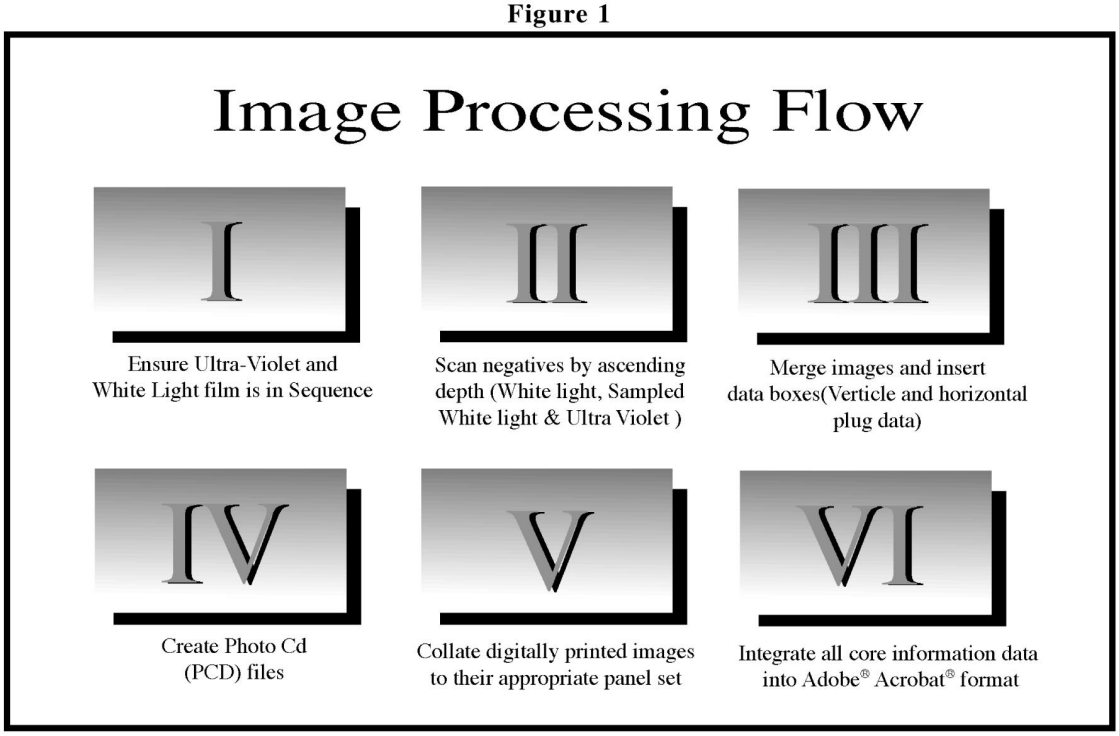


Figure 2

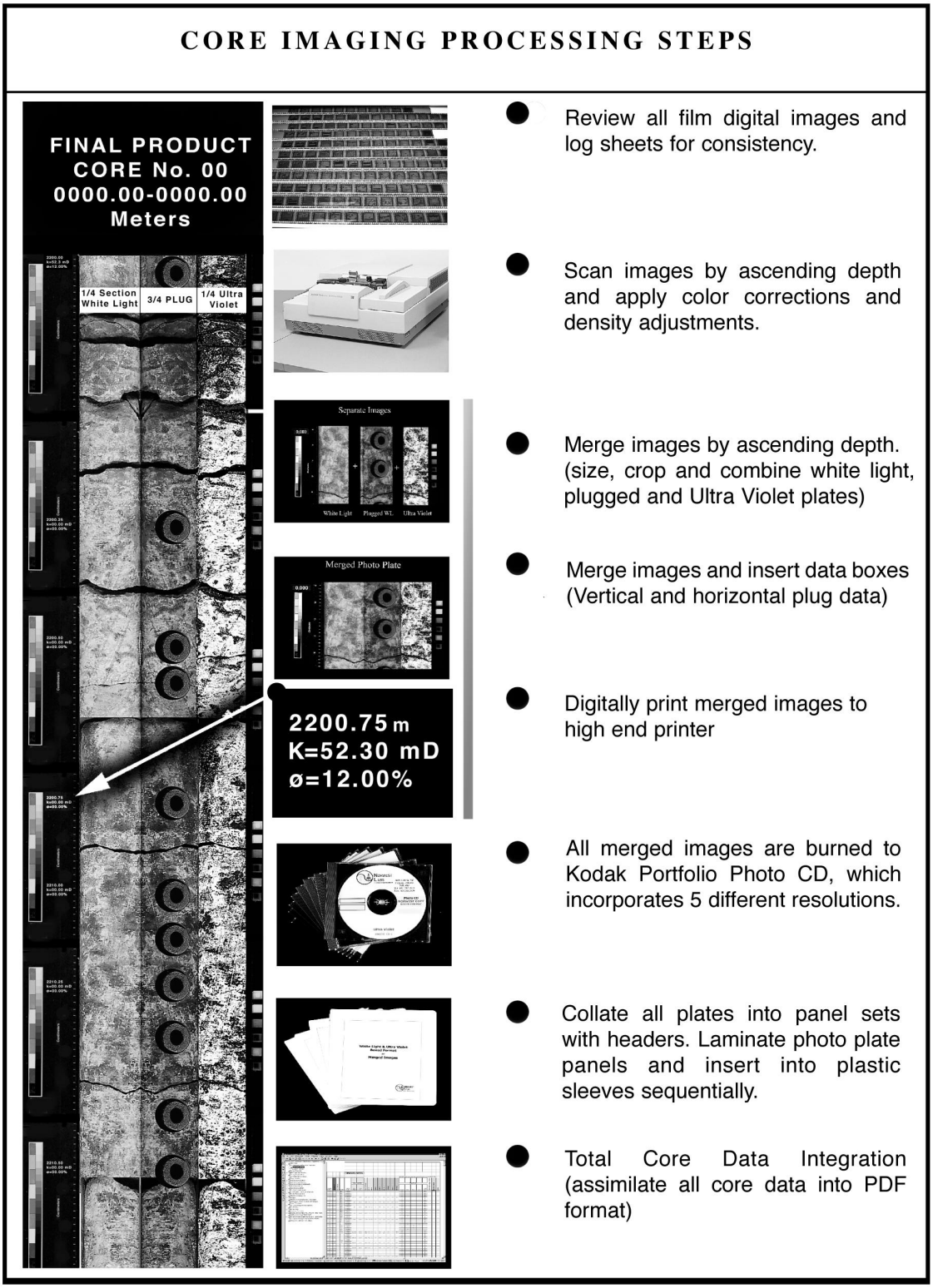
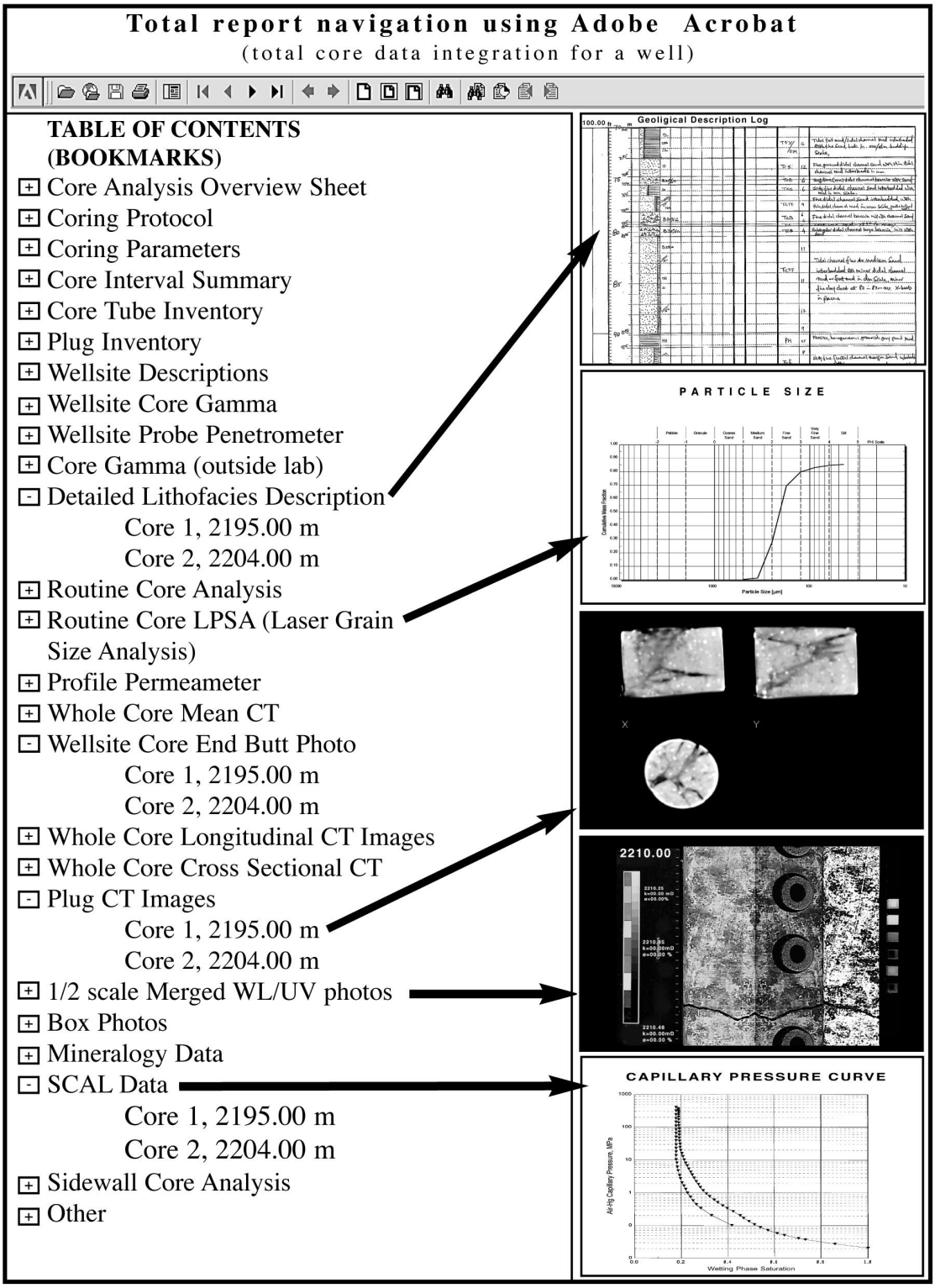

CORE IMAGING PROCESSING STEPS
FINAL PRODUCT
CORE No. 00
0000.00-0000.00
Meters
1/4 Section White Light
3/4 PLUG
1/4 Ultra Violet
Separate Images
White Light
Plugged WL
Ultra Violet
Merged Photo Plate
2200.75 m
K=52.30 mD
ø=12.00%
Review all film digital images and log sheets for consistency.
Scan images by ascending depth and apply color corrections and density adjustments.
Merge images by ascending depth. (size, crop and combine white light, plugged and Ultra Violet plates)
Merge images and insert data boxes (Vertical and horizontal plug data)
Digitally print merged images to high end printer
All merged images are burned to Kodak Portfolio Photo CD, which incorporates 5 different resolutions.
Collate all plates into panel sets with headers. Laminate photo plate panels and insert into plastic sleeves sequentially.
Total Core Data Integration (assimilate all core data into PDF format)

Figure 3



back to contents