

# THE LINE

## CH2MHILL

Providing news  
about interesting projects  
and the company  
to employees and their families

Vol. 17 No. 6 • December 29, 1995



(Left to Right) Howland, Cornell, Merryfield, and Hayes in \$30/month offices in 1946.

## Looking Back 50 Years

### Post-War Beginnings Spawned an Impressive Firm

Here's the short story of how CH2M HILL became one of the world's leading consulting engineering firms. Its 50-year growth mostly was the result of hiring good people, but there also were mergers and acquisitions along the way. Included here are brief histories of the three biggest firms that comprise main branches of the CH2M HILL family tree.

**Cornell, Howland, Hayes & Merryfield** (later CH2M) was the brainchild of Fred Merryfield, an English-born sanitary engineering professor at Oregon State College (now University). Fred, a Royal Air Force flier in WWI and a US Army Corps of Engineers officer in WWII, was a man of strong character, a great teacher, something of a showman, and one with a marvelous ability to recognize and foster talent. In 1938, he advanced the idea to three engineering seniors that there was room for another engineering firm in the Northwest, if it were to do good work. These three students, who later became his partners, were Holly Cornell, Jim Howland, and Burke Hayes. Before WWII, each of the three went to graduate school with Fred's help, and worked in industry or consulting engineering. Then, along with Fred, they spent much of the four war years in the Army Corps of Engineers and in the Navy in overseas combat-area operations.

At the end of WWII, the four founding partners decided, mostly through correspondence, to set up shop in Corvallis, Oregon. Oregon was the state they knew best, and they anticipated that there were many advantages to being close to the laboratories, library, and technical experts at Oregon State College—the only engineering school in the state. Much of the early work was related to sewage—because of a state mandate to clean up pollution of the Willamette River—and water—because of the growing post-war population. The first CH2M office was two rooms over a hardware store in the back of a building in downtown Corvallis; the rent was \$30 per month.

Having grown up in the Depression years, they did not anticipate business would be so good that they would need many helpers. Fortunately, because Fred continued to teach, he knew the strong students at the college and was able to point out new talent when they graduated. Of course, not all of CH2M's staff came from Oregon State. By 1951, the firm had approximately 30 employees. By 1970, the firm had grown to four offices with 310 employees, including engineers, planners, economists, and scientists.

**Clair A. Hill & Associates** (CAHA) was almost single-handedly put together by Clair. Although Clair, a 1934 engineering graduate of

1946 Cornell, Howland, Hayes and Merryfield (CH2M) founded. Reservoir, waterline, sewers, electrical, and solid waste projects done in first year. Clair A. Hill and Associates (CAHA) founded.

1947 Black Laboratories formed. CAHA designed Woodland, California sewage treatment plant.

1948 CH2M designed its first hydropower station. CAHA started major Pacific Gas & Electric surveys in rugged mountain area; supplies by pack train.

1949 CH2M designed its first water treatment plant, Forest Grove, Oregon. Clair Hill named to California Water Commission.

1950 Adopted CH2M monogram, moved into own 3,500-sq.-ft. office, and Reynolds opened BOI office.

1951 Black, Crow and Eidsness (BC&E) formed. CH2M's first major Corps of Engineers work at Mt. Home AFB. CH2M staff = 41.

1952 BC&E converted Orlando to groundwater supply. CH2M rehabilitated Air Defense Command heating systems throughout Northwest.

1953 CH2M undertook 500th project. Hayes and Ryden invented FLOmatcher. CAHA formed Photogrammetric Mapping Center.

1954 CH2M divided Northwest into zones for new business work, did first BPA substation design. BC&E developed 100-mgd supply wells, Havana.

1955 CH2M undertook 1,000th project, purchased drilling equipment for soils work. Merryfield appointed to State Water Resources Board.

1956 First project work jointly between CH2M and CAHA. Worked together for 15 years without formal contract. CH2M staff = 100.

1957 CH2M designed 650-foot-span suspension bridge for Georgia-Pacific. Credit Union formed, offered health benefits package. CAHA with CH2M designed 1,700-home Beale AFB housing.

1958 CH2M used digital computer on water grid analysis, built and equipped soils lab, first major Alaska project (water study).



Jim Howland and Clair Hill exchange stock certificates, 1971.

Stanford University, had been a forestry student at Oregon State College for 2 years and worked in other parts of California both before and after college, he was attracted to return to the place of his roots. His mother's family

*"The circa 1950 report for Newport's water needs got the job done and must have been well received for the firm has been designing Newport's water, sewers, airport, seawall, and innumerable other projects ever since. It truly has been a great time for me in knowing and working with all your people. Our association spans a little over 40 years. The people change but the firm's expertise just grows as new problems, that my generation never even envisioned, will be solved."—Donald A. Davis, Former City Manager, City of Newport, Oregon*

had come from Spokane to Redding by horse and wagon in 1895.

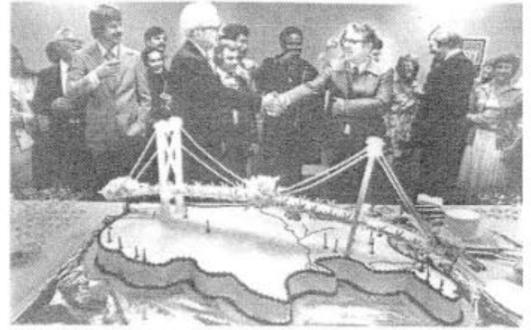
Clair opened an office in Redding in 1938 while also working as deputy surveyor for Shasta County to make ends meet during the Depression. He

reports that he had no intention of building his firm into a growing, diversified organization; he was "just making a living - I enjoyed working for myself." In 1941, he was called to active duty in the Army and spent 2-1/2 years of WWII in Alaska, and the last 13 months of the war on Adak Island in the Aleutians on bomb disposal.

Following Army duty, he returned to Redding and opened his office in a small house across the street from the county courthouse. At this time, northern California was growing, the engineering opportunities were more promising, and he set out to upscale his organization. Early work was mostly surveying, which grew into photogrammetry, and water projects, including dams, reservoirs, and fish hatcheries.

He attracted capable people from the area and before long was recruiting talent from farther afield at the western universities. By 1950, the staff was three engineers, an architect, and two survey crews. At the time of merger with CH2M (1971), Clair A. Hill & Associates had 150 employees in three offices providing a wide range of engineering services.

**Black, Crow & Eidsness (BC&E)** grew out of the work of Dr. A. P. Black, head of the University of Florida Department of Chemistry in Gainesville. Dr. Black has been described as the "Fred Merryfield of the University of Florida." He had a great rapport with his students and looked far afield from the university to provide



Bill Crow (left) of BC&E and Joe Worth (right) of CH2M HILL shake hands at 1977 press conference announcing acquisition of BC&E.

practical knowledge for his students and practical applications for chemistry. He did consulting work and provided laboratory services, activities that grew into Black Laboratories, which he formed in 1947.

The founders of Black Laboratories were A. P. Black, his son Charles, and Bill Crow. Both Charles Black and Bill Crow had served in the European theater of operation in WWII, and returned to Gainesville to finish their engineering studies that had been interrupted by their Army service. Both worked for the City of Gainesville while completing their

*"Their (Mrs. Black, Crow, and Eidsness) technical ability and congeniality that were so often demonstrated exceeded that of any consultants with whom I worked, before or since. These three could be pretty good comedians. At some point in our negotiations I asked for a death clause. Fred's reply was, 'If Doc, Bill, and I are out fishing and the boat capizes and we all drown, you don't owe us a dime.'"—William T. Eiffert, City of Dayton, Ohio*

studies; Bill Crow in the power generating facilities, and Charles Black as chief chemist for domestic and industrial water supply.

Fred Eidsness came from work in industry in the water and wastewater fields. He held a reserve commission in the U.S. Public Health Service, and during the war years was Sanitary

- 1959** CH2M undertook 2,000th project. BOI office did first potato waste project. CVO did Capital Mall (Salem) electrical design.
- 1960** Cornell and Pojot opened SEA office. CAHA started work at South Tahoe PUD. Reynolds made CH2M partner.
- 1961** Pilot plant studies using MicroFLOC in sewage treatment at Tahoe. CH2M designed four powerhouses and pump station on American and Rubicon Rivers (biggest fee to date), and CAHA did location surveys.
- 1962** CVO office addition built. SEA moved to larger quarters. CH2M staff = 130.
- 1963** CH2M undertook 3,000th project. Tested MicroFLOC at LA Hyperion plant. Started quarterly newsletter, now "Reports."
- 1964** CH2M opened PDX office. Did first urban and regional planning and interstate highway work. Major design for new city of Valdez and CAHA for rebuilding the railroad after Alaska earthquake.
- 1965** Tahoe Advanced Wastewater Treatment Plant (CAHA/CH2M project) went on line. CH2M featured in Engineering News Record (ENR). 4,000th project started. Billed \$2 million.
- 1966** CH2M incorporated. Howland president. 116th in ENR list of largest design firms. Specifications changed to CSI format.
- 1967** CH2M staff = 250. equipment companies sold, received ACEC Grand Award for Tahoe plant. Major Boeing airfield work for 747 program.
- 1968** H. Zinder Assoc. joined CH2M. Started 5,000th project. Installed IBM 1130 computer system. Formed Argentine subsidiary. CAHA incorporates five owners.
- 1969** Power work in Thailand and Brazil. CH2M rejected acquisition offer by PRC. Gross income \$6.2 million. Staff = 300.
- 1970** CAHA/CH2M opened joint SFO office. CH2M started Denver AWT successive use project. BC&E bought by Hercules Inc.
- 1971** CH2M and CAHA merge to form CH2M HILL. Opened DEN and WDC offices. Started Upper Occoquan AWT project. Adopted matrix organization. Cornell director of technology.

Engineer for the Florida State Board of Health. He joined Black Laboratories in 1951 to found Black, Crow and Eidsness (BC&E) and also entered a doctoral program at the University of Florida. The goal of BC&E was to expand their economic base by providing a full range of engineering services to municipalities and industries. At the time of acquisition by CH2M HILL in 1977, BC&E had grown to a 200-person water and wastewater firm with seven offices in the Southeast and regional offices in Philadelphia, Pennsylvania, and Rochester, New York.



A.P. Black, 1960s



Fred A. Eidsness, 1970s

CH2M HILL changed markedly during the 1970s. There would be additional acquisitions, and subsidiaries would be created (see the time line in this issue). Gross revenues increased from \$7 million to \$94 million, staff grew from 310 to 1,800 employees, new leadership was installed, and the firm's technological achievements positioned it for even greater challenges in the decades ahead, such as in the hazardous waste field in the 1980s. Now a firm of over 6,000 people, with gross revenue approaching \$700 million, what's in our future? The 1990s see us reengineered and emerging as a real world-class competitor.

(For additional details about CH2M HILL's history, refer to the 8-page color brochure, "Retrospective," which is available in most offices' business development files/library.)

## Founders: Very Different People with Similar Values

CH2M HILL today is the result of the melding of a number of organizations founded by people of diverse skills and similar values. To make the point that the whole is greater than the founders' parts, here are sketches of five founders and two early partners that came together in the initial merger of CH2M and Clair A. Hill and Associates. The common traits most often used to describe Cornell, Howland, Hayes, Merryfield, Hill, Rice, and Roderick were technical skill, public relations/communications abilities, integrity, and leadership qualities.



Holly Cornell, 1965

### Holly Cornell

is a relatively quiet, thoughtful person with tremendous ability to pull the many facets of a project together; a person that inspires confidence. No one in the organization can

ever remember Holly showing anger. If you asked Holly a question, no matter how pressed he was, you got a carefully considered answer. Not only was he a master at organizing and doing projects, but a master of developing innovative solutions. In the days before standard specifications, it was Holly who wrote our first construction specifications in 1946. His new and unique format was used on all projects by us and plagiarized by our competitors for many years.

"In 1951, shortly after I was appointed Seattle's Superintendent of Water, we had the occasion to employ CH2M for some special project. I was impressed by the report, submitted by Holly Cornell, which was clear, concise, and timely, and was, as it turned out, typical of the way CH2M followed through on their contracts."—Roy W. Morse (Retired)

Holly had great strength in developing major clients. It was he who led the effort to secure major work in Denver. He was the only founding partner to leave Corvallis to create a new office, the one in Seattle, where he brought in major work from Boeing and the City of Seattle. After 10 years there, he returned to Corvallis in 1970, became Director of Technology, and moved the firm with his foresight into the computer age.



Jim Howland, 1965

### Jim Howland

is a man with optimism and an upbeat attitude about life. He values humor, being careful not to get too serious, and shuns ostentatiousness, including new cars and

other executive perks. Besides a civil engineer, he is an artist and writer. He is a team player, unselfish and extremely kind in his dealings with people. In the firm he set the standard for one-to-one relationships in offices operating like family. He favored an open-door policy and talking to each other as equals. He pushed integrity in all the firm's dealings, and his motto was, "Anything for an honest buck."

1972 CH2M HILL staff = 600. Started Montgomery County, Maryland, AWT project. Net income \$2 million. BC&E develops Mg. Carb. recovery, Dayton, OH.

1973 Opened SAC office. Staff = 800. Net income \$4 million, stock value up 60%. Added construction management services.

1974 CH2M HILL staff = 1,000. Installed DEC-10 computer. Ranked No. 20 by ENR.

1975 Cornell president. Howland chairman. Lasswell director of technology. Opened Milwaukee (WI) office. BC&E develops aquifer storage and recovery technique.

1976 CHEL (Canadian corp.) formed. Started Milwaukee project—largest to date. Started 10,000th project. First major 5-year plan.

1977 BC&E, with staff of 400, joined CH2M HILL. Their St. Petersburg, Florida, wastewater plant named one of ten outstanding engineering achievements of 1976.

1978 Opened Calgary office. Moyer president. Cornell chairman. Design for Wacker Siltronic Corp., first entry in chip manufacturing field.

1979 CH2M HILL staff = 1,800. Opened SLC office. First director of training Dr. Glen Martin hired.

1980 Started Alexandria, Egypt, sewerage work. Reynolds chairman. Executive offices moved to Denver.

1981 OMI formed. CH2M HILL staff = 2,000. Purchased first CAD equipment. Gross income exceeded \$100 million. Government Affairs office (DCA) opened.

1982 Selected for REM/FIT (Superfund) work (\$133 million).

1983 LTD formed. Number 6 in ENR ranking. Poirot chairman of LTD. CVO moved into new 90,000-sq.-ft. building.

1984 IDC formed. Watson Engineering joined CHEL. Gross income \$200 million.

In the early days, he was responsible for soils and foundations, developing the firm's geotechnical capabilities based on his master's degree at MIT.

Jim can find enjoyment in putting something—anything—together, even a consulting engineering firm. He set out to do engineering, but when it became obvious someone needed to manage the day-to-day operations of the fledgling partnership, he filled the need and carried on for nearly 30 years. As managing partner and later president, he held together the business like a bunch of balloons and saw that they all went up together. He managed by consensus and was a champion of our basic personnel policies, which helped the firm attract, and hold, compatible, motivated, and innovative people to work in a well-knit group.



Burke Hayes, 1965

Hayes from all the partners to be the

**Burke Hayes** has been described as a practical person with stature, poise, and a voice that gains confidence from people on first appearance. The first time a professional was brought in to help prepare a brochure, he picked

representative consulting engineer in a series of pictures with a client (see "Early Brochure" article). Burke is a great conversationalist with the ability to listen and ask the right questions. Backing up these qualities, he had meticulous ability to analyze problems and develop innovative technical solutions. He gathered information like a sponge. In discussions, he calmly prevailed with knowledge and logic but was willing to compromise in subjective situations.

Burke, with his inventive nature, developed the FLOmatcher variable speed electric motor control system, which gained the firm much favorable attention. Another example of his inventiveness was when he converted a child's wading pool into a model of the Pacific Northwest to study ground currents from the initial direct current electrical transmission lines built from the Columbia River to California.



Fred Merryfield, 1965

**Fred Merryfield** was a man that generated ideas at a tremendous rate and had the ability to articulate them and pick people that could carry them out. In the early days, as a part-time project person, he

*"I recall on the train to an AWWA National Congress in Grand Rapids, one of our delegation had left his bag with his heart medicine, essential every four hours, at the station. Fred Merryfield, the man of action, went to tell the conductor, who emphatically replied, 'The Empire Builder doesn't stop for anything, period.' Fred became almost belligerent and convinced the Conductor to stop the train or risk a death before Chicago. A taxi delivered the bag in a few minutes. Once at the Congress, some of us, dressed as indians and Fred as chief, did a dance before the Board to convince them to hold the 1954 Congress in Seattle. It was a wild few minutes."—Roy W. Morse, Former Seattle Superintendent of Water*

was a manager's nightmare; always thinking of something different that needed to be done, and dashing off to do it. As the staff manager (selected and assigned staff), a job he held after retiring from the University, he really focused on the people and did an excellent job. He seemed to realize he had a strong will and was not always easy to work with, and thus tended to associate with people that were both strong and understanding.

Behind all the arm waving and strong will, Fred had a great concern for people, particularly the underdog. He was a tremendous humanitarian as well as a tremendous thinker. If he thought something should be done, he got right in and did it. One year, when an American Water Works Association (AWWA) national meeting was held in the Northwest, Fred arranged for a special train to bring a group to Corvallis, where he entertained the group with a luncheon at the Country Club and sent them back to the train with baskets of cherries.

*"One of the projects of the Berkeley City Council in the 1970s was to take over the electric distribution system of PG&E within the city. Fortunately, CH2M was engaged by city management to do an unbiased study on the feasibility of such a takeover. CH2M did its work thoroughly, assembled data from credible sources, and reported back to the city on the economic implications, both good and bad. The report was fair and balanced with both [sides] pointing to its conclusions. [At the polls] the measure was defeated by a narrow margin. Burke Hayes and CH2M were forever etched in our corporate memory as a firm with high ethical standards, great competence, and effective communicators."—Richard A. Clarke, Chairman of the Board and Chief Executive Officer (Retired), Pacific Gas and Electric Company*

Selected for REM IV (Superfund) work (\$170 million).

Canviro Consultants joined CHEL. Texas region created. Staff = 3,000.

Poirat named "Man of the Year" by ENR for leadership in quality of construction management.

Started San Francisco's Southwest plant (to be under zoo). Peterson director of technology of INC.

Jack E. Leisch and Associates joined INC. Selected for ARCS(Superfund) work (\$400 million).

CHIL formed. CH2M HILL staff = 5,000. Rogers, Golden and Halpern joined INC.

Peterson LTD president. Hessebrook INC president. Zeien INC director of technology. CH2M HILL named nation's top environmental employer by ENR.

Walker Engineering joined IDC. CH2M HILL gross income = \$561 million.

FGL formed. Hill LTD chairman. Business line organization adopted. Quality Improvement (QI) Program initiated. Zeien INC president.

IDC acquired REPA Assoc. Hamford cleanup starts. CH2M HILL ranked by Forbes as 296th largest privately held company in U.S.

Started Rocky Flats program. Gore & Storrie joined CHEL. Design and Construction Group formed. Ranked by ENR as No. 1 "pure design" firm in U.S. and No. 6 overall.

LTD reengineered to global business lines. 50th Anniversary Celebration.

1985

1986

1987

1988

1989

1990

1991

1992

1993

1994

1995

1996

Fred became an officer in virtually every organization he joined; most notably, he was national president of the AWWA and later president of the worldwide International Water Works Federation.



Clair Hill, 1960

**Clair Hill** has a well-earned reputation for being decisive. As a result, he was a very efficient operator; when a decision needed to be made, he made it without a lot of fuss. He,

like Merryfield, had the ability to recognize good people and did not seem to be overly concerned about what others thought of his selection. His political convictions were strong, and he was vocal about where he stood. He has been on the California Water Commission for 30 years, 6 years as chairman. Clair was first appointed by Governor Earl Warren, later Chief Justice of the Supreme Court, and for a later term by Governor Ronald

of his staff took the instruction book in hand, assembled the equipment, and was in the mapping business. Likewise, he saw the potential of using the computer as an accounting tool, acquired the equipment, and set up a separate company to do accounting.



Archie Rice, 1951



Ralph Roderick, 1951

**Archie Rice** and **Ralph Roderick**, although not founders, were as key to the success of the two firms that made up the original CH2M HILL as the founders. They joined CH2M in the first year, 1946, and by 1950 both were equal partners with the founders.

Archie Rice had been a student of Fred Merryfield at Oregon State, done wastewater and water treatment design, been a staff member of the Oregon State Sanitary Authority, and an officer in the Sanitary Corps during WWII. Archie's academic background involved both chemistry and sanitary engineering. He was very strong technically, and had an incisive, analytical mind and a deeply independent streak. He was extremely articulate; a great communicator.

In connection with leading major water supply and treatment projects, Archie developed the MicroFLOC process that became the standard for high quality water treatment. He led the formation of a subsidiary company to market the process and build package water treatment plants. When

the MicroFLOC operation was later sold to Neptune Meter Company, he continued as president for 5 years and continued on the CH2M board. His analytical mind was equally effective in regard to business considerations. The concept for the matrix organization, adopted in 1971, was Archie's, along with numerous other business policies still being followed.

Ralph Roderick, a civil engineering graduate of Kansas State University, brought to the firm a strong background in consulting and city engineering. Of the six early principals, he had the most design experience and probably the best understanding of the municipal engineering market. His was a quiet, thoughtful, flexible approach to problem solving and personal relations. However, when it came to doing the job right, or treating a person properly, there was no compromising with Ralph. His skills and interests meshed beautifully with those of Archie Rice, to make an unparalleled sanitary engineering team.

Ralph's basic approach was that unless there was something new and innovative on every project, the engineer was not doing the job. He had the concept that the MicroFLOC water treatment process could be used in advanced wastewater treatment, and he kept promoting the idea until it was used to design the South Tahoe advanced wastewater plant, the project that really put CH2M and the Hill organizations together and made the combination a national firm. Ralph's competent, down-to-earth approach to technical aspects of a job, together with an easy way with people, made him effective whether presenting the firm or a project to a large city staff or a small town council.

(This article is largely based on *Oral Histories of CH2M HILL*, compiled by Jennifer Lee in 1981. Multivolume, bound copies of these transcribed spoken memories by the early partners are available in most office libraries.)

*"I salute CH2M HILL for being a major factor in the development of the 140,000-acre Glenn Colusa Irrigation District into its position as the Sacramento Valley's leading water district. Coming out of the Depression with little money and no plans or facilities for the fair and equal distribution of water, the newly created district became one of Clair A. Hill and Associates' early projects. I should also call attention to Clair Hill's work on the Federal Water Contract negotiations for the District which became the model for the entire valley."—Ralph A. Nissen, Farmer and Retired Board Member, GCID*

Reagan. Among many offices, he was chairman of the state Chamber of Commerce, Water Committee.

Clair was a man of vision, with ability and drive to turn visions into reality, and also turn them to his benefit. He saw that the airplane could be the key to success in operating a business in the then rather remote northern California area, in the days before the interstate highway system. He acquired a plane, learned how to fly, and paid for flying lessons for his key engineers. He also saw that aerial mapping had potential, ordered the mapping equipment, and, with some

*"My first project with CH2M was in 1955 when Archie Rice supervised the design and construction of major alterations to our Winchester Filtration Plant. This project resulted in significant improvements to our operation. The professional relationship was excellent. Later, in a joint venture, we participated in MicroFLOC's first "package" plant. The technical and practical skills of CH2M's personnel resulted in several subsequent projects."*  
—Alton R. Andrews, Former District Manager, Oregon Water Corp.

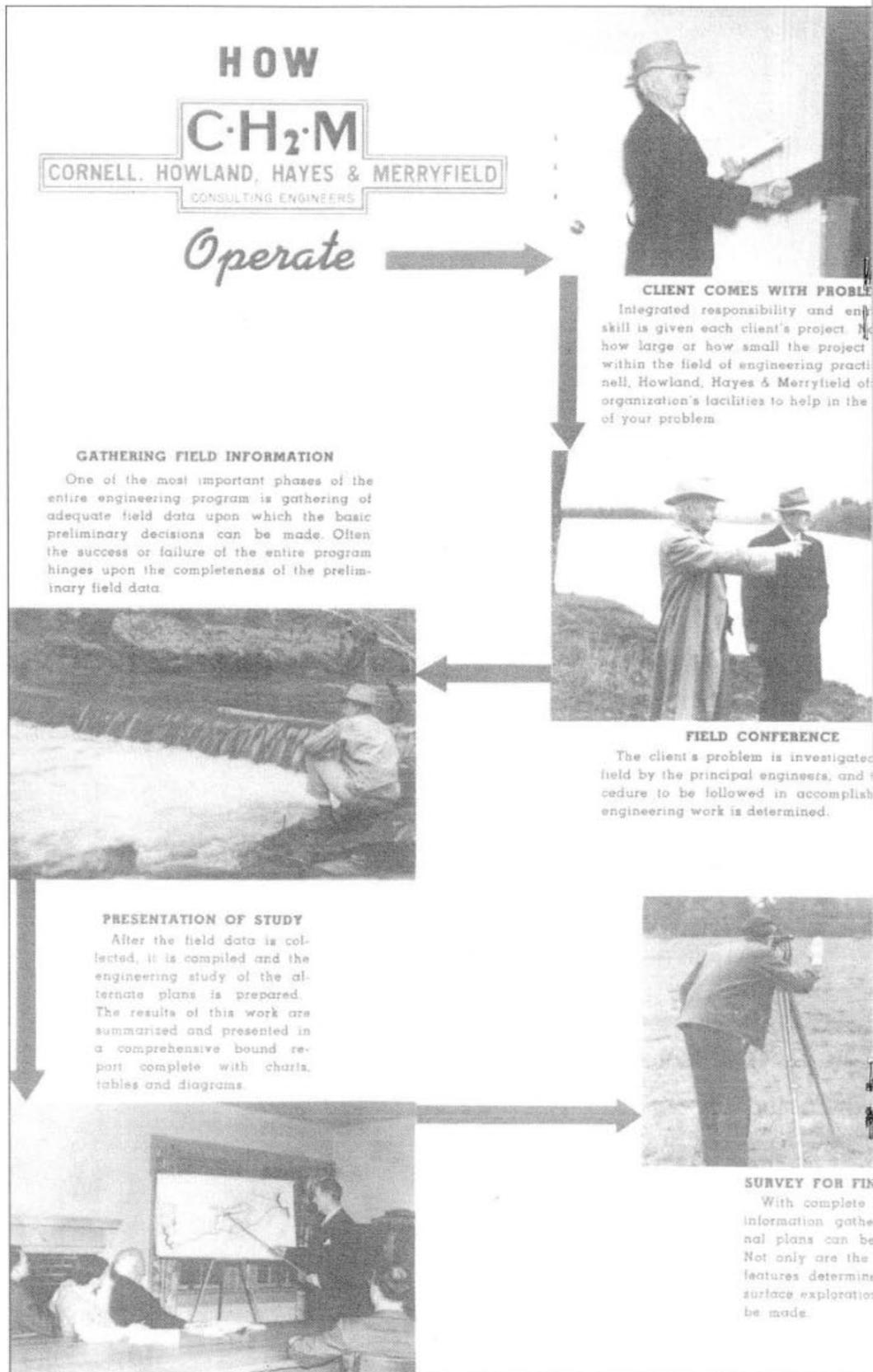
## Early Brochure Stresses Importance of the Client

For perspective on how we did our work in 1951 compared to now, read (on the page to the right) excerpts from the first CH2M brochure produced using outside professional help. Client service was and is paramount.

The mayor of Corvallis, a retired Oregon State College (now University) president, played the part of the client and appeared in a good share of the pictures. The publications consultant was asked to pick the partner that "most looked like a consulting engineer" for the photographs, and he picked Burke Hayes.

In the picture captioned "WRITING THE CONTRACT DOCUMENTS," Burke is dictating using a converted electronic wire recorder. This early electronic recorder (before the "tape" recorder) was actually developed for recording music. The on/off switch was on the machine. In his clever way, Burke added a wooden handle to the switch, to be operated by one hand, and found a microphone that could be held in the other hand. When the wire broke, which it did on occasion, one generally ended up with a worthless handful of wire that had the appearance of steel wool—a far cry from digital recording of today.

*"I have a vivid recollection of [your first office], one fairly good-sized room with five desks. I was amazed when I returned some months later to find how the firm had grown. We always received the same prompt outstanding professional attention to our problems from the early days with a handful of employees to the later days with thousands of employees."—Walter H. Smith, Former President, Intermountain Gas*



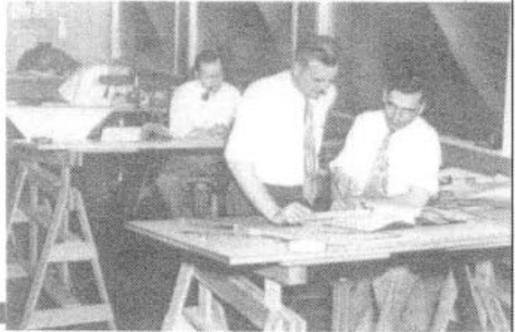


**DESIGN CONFERENCE**

A wide variety of engineering skills are brought to bear upon the solution of each problem. The work of these various specialists in engineering is coordinated in design conferences.

The work of the designers is converted into working drawings for the project by the drafting department. The designers work closely with the draftsman in all phases of the work.

**PREPARATION OF PLANS**



**WRITING THE CONTRACT DOCUMENTS**

Along with the design and while the drafting work is under way, the contract documents are prepared. These Contract Documents include the detailed specifications of the method and materials to be used in construction, the Advertisement for Bids, the Information for Bidders, the Proposal Form, the General Conditions of the contract and the Contract and the Bond forms.

**OPENING OF BIDS**



The plans and contract documents for each phase of a project are bound together in one complete volume. These are issued to qualified General Contractors who in turn submit competitive bids. These bids are analyzed and reported to the client with recommendations for award.



**SUPERVISION OF CONSTRUCTION**

After the contract is awarded and construction begun, the work of the Contractor is continuously supervised by the Resident Engineer and by the Design Engineer.

**FINAL INSPECTION**



When the construction has been completed, a detailed final inspection is made by the Resident Engineer and the Supervising Engineer, generally accompanied by the Client or his representative. Based on this final inspection, final payment to the Contractor is made and the "as built" plans are prepared for the Owner's files.

DESIGN  
survey  
the li.  
pared.  
ographic  
but sub-  
ust also

# Tahoe Project Brought CH2M and HILL Together and Catapulted Us to the National Scene

The most significant project in the 50-year history of our firm is undoubtedly the advanced waste treatment (AWT) plant for the South Tahoe Sanitary District. It was the catalyst that brought the two firms, CH2M and Clair A. Hill and Associates (CAHA) together. It also led directly to the Upper Occoquan Sewage Authority AWT Plant and extensive sewerage system in Virginia, near Dulles Airport, and the opening of our first East Coast office in Reston, Virginia. How we got there is a complicated and marvelous story. It took fortunate circumstances and many tremendously capable people to solve the technical and political problems.

The story starts with **Clair Hill**, based in Redding, California, meeting CH2M's **Archie Rice** when, as competitors in the late 1940s, they were both prospecting for work on the southern Oregon coast. Archie told Clair about CH2M's mechanical, electrical, and wastewater treatment process design capabilities that complemented the extensive capabilities of the Hill organization in the civil engineering and mapping fields. Later, Clair hired CH2M as a subcontractor to assist in the design on some northern California projects, and the association was under way.



Former President Ronald Reagan and Clair Hill, 1969

The scene then shifts to Lake Tahoe in 1960, where a San Francisco firm found themselves on the losing side of a South Tahoe Public Utility District recall election, so the District was ready to hire a new engineering firm. They hired CAHA. The district had in hand plans, but not enough money, to build a very expensive deep pumping



Senator Mark Hatfield and Gene Suhr, 1978

station. Several years before, **Burke Hayes** had invented, and **Carl Ryden** improved, the variable speed FLO-matcher pumping system. Also, CH2M had developed designs for economical deep pumping stations using circular caissons. CAHA called on CH2M to assist in a new design for the Tahoe pump station, and it was built for a fraction of the estimated cost of the first proposed design. This surely cemented relations with the district.

When regulatory and other restraints made it necessary for the Tahoe District to provide a higher degree of treatment than secondary treatment would provide, the district turned to CAHA, who engaged CH2M. The solution was to combine elements of the MicroFLOC water treatment process, developed under Archie Rice, with activated carbon columns; something not done before. CAHA's **Harlan Moyer**, with CH2M's **Gene Suhr** as principal designer, led the project and steered it through a maze of technical and political problems. The plant was built — it wasn't easy, but our staff got it to work — and, with people liking to visit Tahoe, they came from far and wide to learn about

this innovation. For 3 years after start-up, we had two-person engineering teams at the plant doing research and explaining the operation to visitors. Those teams included **Dave Evans**, **Bob Chapman**, **Jerry Wilson**, and **Clint Smith**.

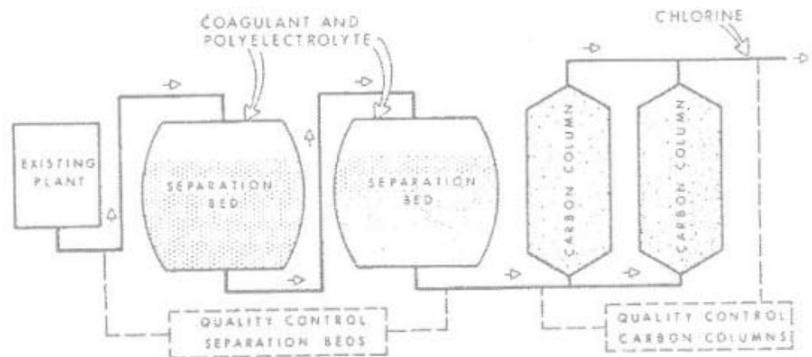


Harlan Moyer, 1990

A movie on the project was prepared with an introduction by Ronald Reagan, Governor of California, one of the many visitors to the plant.

Another visitor was Norman Cole, Chairman, Virginia Water Quality Control Board. When the request for proposals came out for an advanced wastewater treatment plant serving a major developing area of northern Virginia, it required that the plans had to be approved by the designers of the South Tahoe plant. Harlan Moyer, **Sid Lasswell**, and Gene Suhr went to the Upper Occoquan Sewage Authority with a major proposal. In order to break a tie vote, Harlan agreed to establish an office in Reston and move there to become the project manager. They got the job and Harlan took up residence in Reston.

**George Gunn** headed services during construction, and then became the WDC regional manager. Again the plant worked, with George keeping the client happy. Now, 25 years later, we are designing the 4th addition to the plant, and WDC is one of our largest offices.



The separation beds operate in series while the carbon columns operate in parallel; note the quality-control arrangements for both units.

A new design combines the latest scientific and engineering advancements to produce . . . The Most Complete Wastewater Treatment Plant in the World.

(From American City, 1964)

"Norman Phillips, the 'technical genius' at the Virginia Department of Health and a man for whom I had the utmost respect, and I visited Gene Suhr and Harlan Moyer early in 1972 to discuss the Preliminary Engineering Report for the UOSA Project. At that meeting, Norman said the UOSA PER was the best report he had ever read. I knew it was the best report I ever read, but it carried special significance to me when it came from Norman. This confirmed for me very early that CH2M HILL was an exceptional engineering firm. CH2M HILL has many outstanding people and I have great respect for their professionalism and expertise."—Millard H. Robbins, Jr., Executive Director, Upper Occoquan Sewage Authority



(Left to Right) Gene Suhr, Bob Adams, Lamont Mathews, Dick Ivey, Otto Vydra, Craig DeMott, Les Wierson, and Sid Lasswell (doorway). (Note: Not all individuals pictured are retired.)

## Retirees Recall Expectations and Careers

We managed to get a few of our retirees to send us their thoughts about when they joined the firm and the high points of their careers. This was not easy, considering they're so busy with golfing, motorcycling, snowmobiling, camping, volunteering, traveling, hiking, photographing, fly fishing, woodworking, gardening, and remodeling. (Work was fun but...)



Joe Patten, 1970s

"[With the CH2M and Clair A. Hill and Associates merger] we certainly experienced a fruitful synergism. My only frustration, if you can call it that, was explaining "water resources"

to a bunch of sanitaries. Serving on the Board was my high point with the firm, helping develop the long-range planning program in 1975, the objectives of which I think were met in the following years." —Joe Patten



Fred Harem, 1968

"When I joined the firm in 1951, my biggest expectation was a regular paycheck to support my family! I could never have hoped to be associated with a finer group

of people. My career path was paved by those preceding me, and they provided the basis for a very stable business with high standards, of which we can all be proud."—Fred Harem



Sid Lasswell at Bend Softball Tournament, 1991

standards. It gave us something to point to with pride and helped us get still more important jobs. There's a lot of opportunity for personal growth in this firm and the professional challenges are unlimited. I've gotten a lot of satisfaction over the years from helping the firm grow."—Sid Lasswell



Earl Reynolds, 1966

"When I joined the firm in 1948, I was impressed by the caliber of the people, and looking back over the last 48 years, I recognize they were even more outstanding than I observed at the time. Back then, too, I was probably a little brash to ask that I have the opportunity to work into an ownership position. But it came to be, and the high point of my career was being

selected chairman. I can't realistically imagine how I could have enjoyed any other career as much as I have the years with CH2M HILL!" —Earl Reynolds



Bob Adams, 1968

Corvallis office, and directing civil engineering firmwide."—Bob Adams



Bill Watters, 1965

"In 1950 I thought we'd do more structural work (buildings and bridges) than utilities. I expected slower growth. The Trinidad, West Indies, water projects were certainly memorable. I worked with a super great group of people." —Bill Watters

## Early Business Approaches Still Relevant

Certainly there were lots of business opportunities after WWII, but not every enterprise that was started back then automatically achieved the long-term success of CH2M HILL. Then, as now, the first 2 years or so of operations were critical for survival. The keys to success that allowed CH2M, CAHA, and BC&E to survive their first years and grow are reflected in today's list of CH2M HILL Organizational Values, codified recently as a result of the reengineering process. It seems we can still say, "Some things never change."

**Client Focus** - To do engineering business, one must have identified clients and know their needs. The founders started in their home geographic areas, developed business relationships from initial academic and professional society contacts, understood the what and why of clients' problems, and then approached their clients with the needed answers and abilities to solve those problems. For example, Clair Hill, a Redding native, knew many farmers; Fred Merryfield was active in the American Water Works Association; and A.P. Black's laboratory services started with the University of Florida. Also, CH2M bought core drilling equipment when such services were not available, CAHA bought airplanes and cameras for aerial surveying, and BC&E expanded its laboratory and engineering services.

**Emphasis on People and Collaborative Environment** - The firms were selective about the people who would join their staffs. Once they got the "right" people, how were they to hold on to them? Share in the prosperity and decision-

*"I remember with admiration Don Marske's tenacity in establishing a working relationship with the District. The District had a long-term relationship with another major engineering firm, but the need for some 'new' and innovative thinking led us to CH2M HILL. [Your firm's] work on developing our Metrogro program in the 70s [and facilities planning] showed significant foresight and innovation. Best wishes for another successful 50 years!"—James L. Nemke, Chief Engineer and Director, Madison Metropolitan Sewerage District, Wisconsin*

making. Bonuses and ownership prospects were combined with personal attention, respect, and involvement extended by senior staff. Little things can count. A word of encouragement here, an opinion asked there, a thanks given for the extra effort.

**Honesty and Integrity** - As with any professional service provider, engineers need the trust of their clients to get work. After all, people's health, safety, livelihoods, and pocketbooks are at stake. Trust comes from being openly honest and unswerving in integrity. The maxim was and is, "Don't do anything you wouldn't

*"During the interview process [other consulting firms] were represented by their outstanding engineers. However, once they had the contract, I never saw or heard from them again. With CH2M the opposite was true... Bob Adams was constantly available and a frequent observer on the site during construction. I always got what I paid for... probably a big element of your success."—Alfred M. Eschbach, Former Chief Engineer for the Port of Portland*

want to read about on the front page of tomorrow's newspaper." Sure, we have been accused in the past, but for a firm this size the instances have been rare, we have been vindicated, and our fine reputation is intact. As the Seattle Post-Intelligencer said in an editorial (April 4, 1993), "CH2M HILL's integrity...it is laudable to see a contractor willing to go to such lengths to ensure the taxpayers get their money's worth."

**Continuous Quality Improvement** - From educational classes for employees, to pilot plants for testing processes, to professional society conferences and journals for sharing technologies, to process-oriented and client-focused business practices for profitable growth, there has been a long-standing acknowledgment that a better way may be out there. The firm has consistently supported its employees in professional development as well as making engineering advancements to water treatment, environmental restoration, and community planning and infrastructure improvements. CH2M, in the days of the 44-hour work week, devoted part of Saturday morn-

ings to training; now we have PMI<sup>2</sup> and QI training.

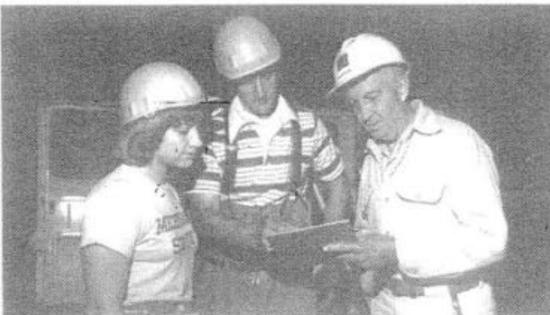
**Quest for Innovation** - "Build a better mouse trap and the world will beat a path to your door." Early examples that come to mind include the FLOmatcher variable speed pumping system, the FLOWatcher surface water supply turbidity monitoring and diversion equipment, and the MicroFLOC multimedia filtra-

*"I feel BC&E's most outstanding recommendation [to us] was the decision to change from surface water to deep wells as our source of supply. This resulted in the largest well drilling contract ever let in the U.S. at that time. Reduction in treatment costs and greatly improved taste were outstanding benefits."—Curtis H. Stanton, Former General Manager, Orlando Utilities Commission*

tion system. Later examples include variations of bioremediation, soil vapor extraction, wetlands treatment technologies, irrigation systems, the SEGS-1 solar power project, and infrastructure information management systems, to name a few.

**Financial Strength for Long-Term Growth** - The importance of this was recognized early on but was difficult to achieve for many years, even though much of the profits were reinvested into the business. Starting with virtually no capitalization and no financial backers, then growing so quickly that building capital was difficult, the financial picture was shaky for many years. Each early partner in the CH2M and Hill organizations was on the note for the entire company borrowings

*(continued on bottom of next page)*



Anne Kernkamp, Jim Newton, and Jim Howland, 1978

*"One of my greatest privileges as mayor of Boise was the honor of appointing Earl Reynolds to the Planning and Zoning Commission, on which he served 16 years. It has been a source of amazement to me how he could be so generous with his time while establishing such an enviable record with CH2M HILL."—Robert L. Day, Former Mayor, City of Boise, Idaho*

## We Go Full Circle Back to Regional Newsletters

Very early, the need for distributing internal communications resulted in a now-and-then newsletter, mostly written by managing partner, Jim Howland. It was believed every person in the office should know everyone else by name and what the projects were. In the 1950s, with two offices (Corvallis and Boise), the need for a scheduled weekly publication, distributed to each employee in both offices (the first "region") was recognized. It was a newsletter that published the job numbers, titles, and project engineer initials for each new project, introduced new employees, noted special events, and carried short stories about projects and the people working to get them or do them. Not exactly typical were these project listings:

- C5951.0 1600 Pennsylvania Ave. Washington, DC., Sewage study. AF
- C5001.6 Fort Knox, Louisville, Kentucky, Gold leak investigation. AF

As suggested by the project engineers' initials (AF), this was the April 1 issue.

In 1975, with several more offices in the firm to tie together with shared information, the newsletter went to a monthly tabloid, "The Tie Line." The name was selected through an in-house contest. One name not selected was "The View From CH2M HILL" submitted by John Graham, who still views and does projects worldwide from CVO. However, budget cutting in 1976 axed the newsletter. In 1979, the newsletter was resurrected as the single sheet "Mini



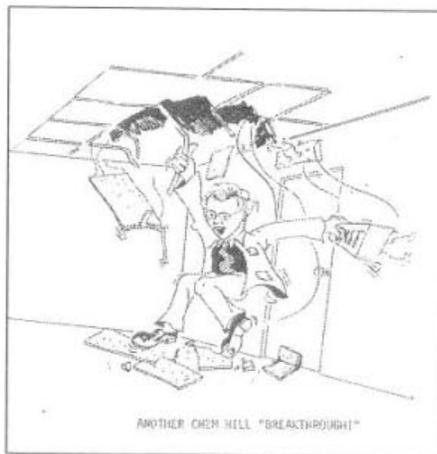
Tie Line," issued about every 3 weeks. That newsletter, as with those before and the one to this day, have been largely written by Jim Howland with the editorial and production help of Corvallis staff and the president's review.

Since stepping down as president, Jim has continued to travel to offices around the firm to share the "Events and Philosophies that Shaped the Firm," meeting new employees, gathering news about interesting projects and people's doings, and writing articles for the newsletter—all with a touch of humor. One special edition, carrying the banner "Tini Mie Line," appeared outside the normal 1979 publication schedule. It seems President Harlan Moyer had fallen through the ceiling of the Denver office at 10 pm one night, trying to exit along with a group of board members who became marooned in the building's locked hallways. Harlan vowed that the "Mini Tie Line" would be eliminated if it published the gossipy story. It survived, and the "Mini" was finally dropped from the name.

As a result of input from employees through surveys and focus groups, publication of *Tie Line* became less frequent this year. **This is the last planned issue of *Tie Line*.** In 1996, the firm's internal com-

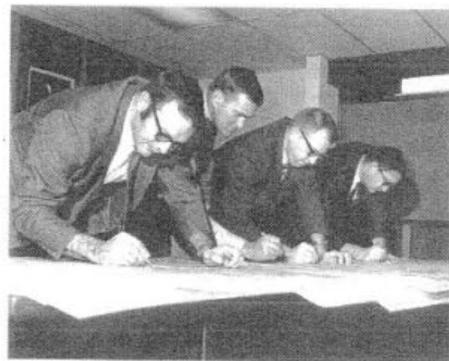
munications will be modified to address the communication needs of a more global organization. Stories about people and projects continue to be of interest, however, particularly on a regional level. Regional newsletter editors will be asked to cover local projects of interest, and highlight employees within their regions. Jim Howland also will continue to submit articles as a "roving reporter" and contributing editor for regional publications.

### THE TINI MIE LINE



### TIE LINE

Volume 10, No. 1 CH2M HILL Spring 2, 1999



(Left to Right) Lamont Mathews, George Dotson, Bob Pailthorp, and Dick Nichols, signing plans about 1965

(continued)

should there be a default. Today we have a solid line of credit and record-level earnings to support our chosen path of growth.

**Community Commitment** - Our staff have consistently devoted their time and resources to the areas where they live. As volunteers or financial supporters, we have made significant con-

tributions individually, and the regional offices also have sponsored community enriching events. Blood drives, community festivals, United Way, school programs, PBS TV programs, and computer donations are a few ways we have made a difference in our communities.

*"The McMinnville Water and Light Commission [Oregon] has had a long and pleasant association with CH2M HILL.... Their [your project managers'] talents were and are appreciated, and I consider each of them a friend."— Alan H. Jones, General Manager (Retired)*

## 50th Anniversary Plans Made

Activities commemorating the firm's 50th anniversary in 1996 will range from those with nationwide coverage, such as a series of historical articles in *Reports* magazine, to local celebrations that will mark a date of local importance within an office or region. In September, the firm's legacy of community involvement will be celebrated by employees throughout the country during "Community Service Month." Offices will be invited to identify and participate in a local volunteer event within their community. And, in keeping with the firm's focus on clients, our founders and senior managers will participate in events and receptions for local clients.

## Our Markets: The World

While the firm's core markets remain essentially the same—public and private sector water, environment, transportation, industrial facilities and related infrastructure—CH2M HILL is re-engineering in order to compete more



Earl Reynolds, in 1983, finally got his gray.

*"I was trying to remember how we came to hire Earl Reynolds in the first place. All I can remember is that after my father came back from Boise, he said that he had hired a very bright young man who had one fault. He didn't have any gray around his temples. The friendship that started during those years has been a lasting one and we still enjoy seeing each other. It is a fine recommendation for your business that that kind of relationship can be established and maintained for over 40 years."*

—Ralph B. Peters, Former Mayor of Jerome, Idaho

effectively in a global marketplace. Fifty years ago, our clients were typically local municipalities. Today, our clients may range from a small, local water utility, to a large, multinational corporation. The firm's reengineering effort positions us to serve the entire range of clients equally well.

Six global business groups will meet our clients' needs: the Environmental Business Group, Federal Systems Business Group, Transportation Business Group, Water Business Group, Industrial Business Group, and O&M Business Group. Additionally, a new Capital Services Company (CAPCO) will deliver financing assistance to all business groups. Three new regions will serve the business groups:

the Americas Regions (Canada, U.S., and South American operations); the Europe/Mid-East Region; and the Asia-Pacific Region.

This newest strategy positions the firm to offer truly global, full-service delivery to our clients worldwide. It also gives us the capability of offering our clients project financing in addition to planning, engineering, construction and operations.

When you take a good, hard look at it, however, you'll notice that this new strategy isn't really all that new. It's what we've been doing for the past 50 years—doing whatever is necessary to meet our clients' needs and help them solve their problems.

P.O. Box 428  
Corvallis, Oregon 97339

# CH2MHILL

*Celebrating  
50 Years*

