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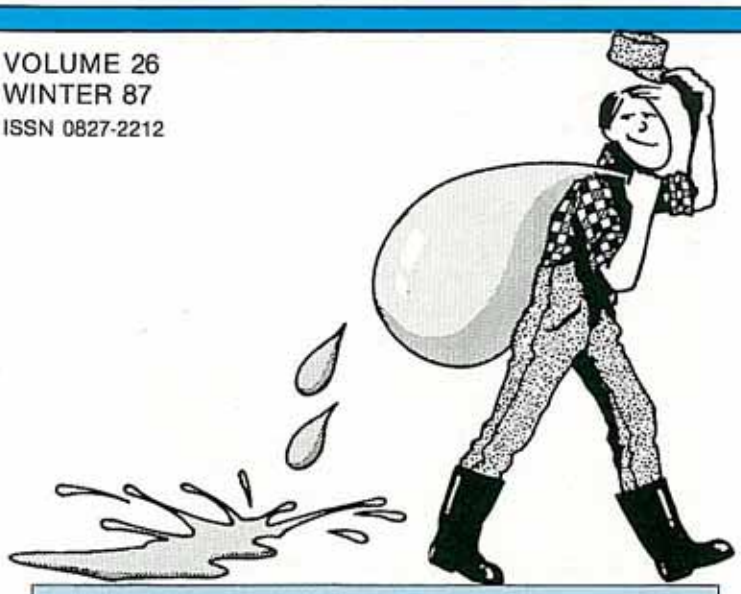

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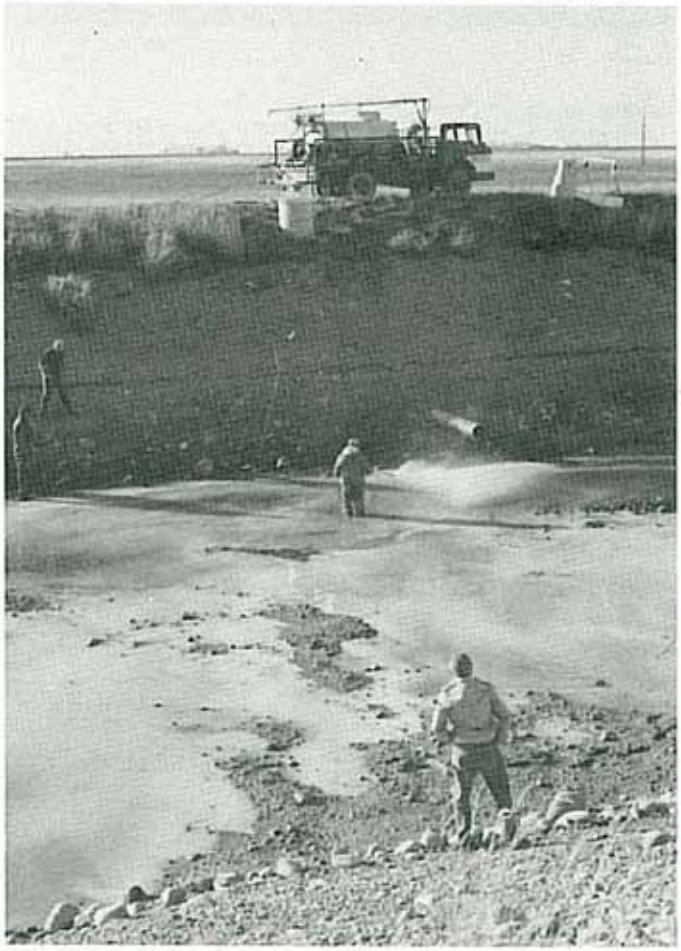
KARMEX TO THE RESCUE

A New Approach to Chemical Weed Control in Canals

In spite of being completely rehabilitated 5 years ago, the St. Mary River Irrigation District's Main Canal below Stafford Dam is beginning to experience an aquatic weed problem. The weed, Sago Pondweed (Polamogeton pectinatus), is beginning to grow in the earth bed of the canal. There is no sign of any problem occurring on the armoured sideslopes. Evidence of Sago Pondweed can be found for approximately 5 km downstream.

Monte Flexhaug, the S.M.R.I.D.'s operation superintendent, became concerned when it was apparent that accurate water measurements were not obtainable at their downstream water metering station.



Dudley Spraying Systems applied 27.2 kg per acre of wetable Karmex powder in late October 1986.

Computerized operation of the Stafford headgates (by downstream control) depends upon correct readings. The weed growth affected readings to such a degree that S.M.R.I.D. management changed the downstream control method, over to headgate position.

Flexhaug's first inclination was to use the chemical acrolein (Magnacide H), however, this would be very costly and require repeated applications. Instead, the District chose to treat, under permit from Alberta Environment, an experimental section with Karmex. Karmex can be used as a soil sterilant and may control weeds for up to three years.

For irrigation canals, DuPont's Karmex is applied during the non-operating season

The canal must be drained down to expose as much moist bare soil as possible for Karmex to become fixed in the soil. In the spring, the canal at start up must be flushed for a period of 72 hours and the water diverted into an irrigation reservoir. DuPont warns users of Karmex not to treat any ditch area into which roots of trees or other desirable plants may extend. The toxicity to animals, birds and fish is low if used in recommended amounts.

The active ingredient in Karmex is diuron. Absorption increases as clay content and/or organic matter content of soil increases; clays of high exchange capacity absorb more diuron than those of low exchange capacity. Leaching from the soil back into the water is not an important factor in most soils. Movement by leaching is least in soils high in clay and organic matter but greatest in sandy coarse materials. Microbes are the primary factor in the disappearance of diuron from soils.

The Karmex test section will be monitored with interest throughout the operational season and we will keep readers posted.■

TYRRELL-RUSH LAKES PROJECT BENEFITS AGRICULTURE AND WILDLIFE

1st of It's Kind

The Tyrrell-Rush Lakes Complex represents the first of twenty or more "Wetlands for Tomorrow" projects to be constructed in Alberta. The program will ensure the preservation and enhancement of Alberta's wetland resources for future generations. The project, located 48 km southeast of Lethbridge, is an excellent example of how good water management decisions can improve conditions for agriculture while enhancing wildlife habitat. Cooperating in this first project were: Alberta Environment, Alberta Forestry, Lands & Wildlife, St. Mary River Irrigation District, Ducks Unlimited Canada, and the County of Warner.

The Tyrrell-Rush Lakes project has a number of physical components which provide a range of benefits:

- A main drain will relieve flooding and improve drainage of agricultural land.
- Water supply canals to both lakes can be used to stabilize water levels if they drop too low.
- A channel from Tyrrell Lake will improve drainage during flooding.
- A dike dividing Rush Lake can be used to manipulate water levels and to encourage vegetation growth for the enhancement of waterfowl habitat.
- Fish screens have been provided on the water supply canal into Tyrrell Lake to prevent undesirable fish species from entering the lakes.

Project capital costs were approximately $1.6 million, of which Alberta Environment funded $1.1 million for the water management component, Alberta Fish & Wildlife $270,000 and Ducks Unlimited Canada $223,000. In addition, Alberta Environment funded all necessary land purchases.

Hon. Don Sparrow, Minister of Forestry, Lands & Wildlife, explained that "over the next five years the Wetlands for Tomorrow program aims to develop at least 20 major wetland areas which will affect approximately 985,000 acres of land. This will help ensure a lasting wildlife legacy for all to enjoy". Hon. Ken Kowalski, Minister of Environment, commented that he "looks forward to future opportunities to contribute to this excellent program through the work of Alberta Environment". Taber-Warner MLA, Bob Bogle, added that he is "delighted with the outcome of this project and looks forward to seeing the benefits it will have for the local community".

If any Irrigation District has a project that they may wish developed as a multi-use Wetlands for Tomorrow project, please contact Mr. Lorne Fitch at (403)381-5266 for further information.■

Tyrrell-Rush Lakes Opening Ceremonies
From Left to Right, Ken Kowalski, Minister of Environment; Don Sparrow, Minister of Forestry, Lands & Wildlife; sons Michael Kowalski & John Bogle, holding wooden canvasback duck carvings (presented by DU); MLA Taber-Warner Bob Bogle.

DATALOGGERS

Revolution in Data Collection & Storage

Progress in the electronics and especially in micro-computer technology has caused a revolution in the scientific areas of data collection and storage. Many traditional paper print instruments are being replaced with electronic meters or gauges which transmit an electrical signal. In many cases, these electrical signals are now being converted from analog to digital form and stored in electrical memory until needed. Machines which can do such a job are called dataloggers.

There are many types of dataloggers on the market with prices ranging from several hundred to several thousand dollars. The simple ones are normally preprogrammed, by the manufacturer, for a specific function and usually have very limited memory capabilities. The sophisticated ones can be programmed by the user for many functions and normally have large memory capabilities.

Dataloggers have been used successfully in a number of irrigation related activities. Some of these activities include:

i) water level recording
ii) precipitation recording (both rain and snow)
iii) humidity recording
iv) pump start and stop records

Project Planning Branch of Alberta Agriculture has been using electronic dataloggers for several years now and has come up with a type of shopping list which may be useful if you are in the market to purchase this type of equipment. Some of the important features which must be looked at when comparing different machines are:

(1) Analog Channels: A typical mid-priced datalogger should have 8 analog input channels which have 0-2.5 or 0-5 volt ranges and should have the capabilities of single or double precision storage. This channel is used to monitor inputs from pressure transducers, thermocouples, etc.

(2) Accumulator Channels: The datalogger should also have 8 accumulator input channels. These channels are used as electronic counters for such things as tipping bucket rain gauges.

(3) Parallel Channels: This part of the datalogger is actually an on-off switch register and the datalogger should have up to 8 of these input channels.

(4) Memory: A medium priced datalogger should have a minimum of 8K memory and preferably 16K. (It is important to check on the number of bytes of storage required for each data point recorded.) 1000 bytes = 1K.

(5) Power Source: Most dataloggers use lithium batteries which should have a warranty for at least 3 years.

(6) Accuracy: This is an area which is totally up to the individual user, but accuracies of 11 bits over the entire range is reasonable.

(7) Data Transfer: If time is a concern in transferring data from the datalogger to main computer, then solid state memory modules, not cassette tapes, should be used.

(8) Another important part in making the decision of which datalogger to buy is, whether or not there is a local repair service and how fast these repairs can be done. Anything more than 2-3 days should not be acceptable.

For further detailed specifications, or other technical information on dataloggers and their use, please contact Mr. Svat Jonas, P.Eng., Project Planning Branch, Alberta Agriculture, Agriculture Center, Lethbridge, Alberta, T1J 4C7 telephone (403)381-5164.■

DYNA-LINER:

A Cheaper Alternative for Lining Canals?

Can an Dyna-Liner, a new exposed canal liner, prevent seepage and provide a low-cost alternative to reinforced concrete and buried membrane liners?

This is one of the questions the Eastern Irrigation District is trying to answer with two full-scale field trials now underway. Much of the land in the E.I.D. has been land-leveled, leaving borrow areas for canal bank rebuilding at a premium. According to Jim Webber, District Engineer, borrow dirt is almost impossible to obtain in some areas leaving the District with few rehabilitative alternatives that are still cost effective.

Keith Strong of Dynamic Water Conveyances Inc. believes he has the answer to the E.I.D.'s problem, or at least a very cost efficient alternative to other existing costly products.

Although Dyna-Liner is a new product, it is composed of time-proven components. It is made of a composition of polyester, rubber and asphalt combined to form an impervious, tough blanket which, when properly keyed into the existing slopes, will withstand water, weather, and the cow that happens upon it.

The specially blended rubberized component is a variation of the new cold poured crack fillers used extensively on highways. The polyester component is the familiar reinforced geotextile filter fabric Terrafix 270R.

The District installed Dyna-Liner as a surrogate liner in a badly cracked concrete slip-form lined ditch. The bed of the existing concrete channel was cleaned of debris, sandblasted and the fabric was rolled out. The liner was held in place by two continuous pipes which were redheaded to the concrete at the toes of the sideslopes. To anchor the top, the material was buried 0.8 of a metre into the bank. Three coats of the rubberized asphalt were then sprayed on.

In metering tests this past summer, the Project Planning Branch was able to meter the friction coefficient (n) for the Manning's velocity equation, generally used in this type of channel. They found the section had a Manning's n of 0.016.

A second 400 m trial section of Dyna-Liner was installed in an unlined earth lateral this past fall. A gradall was used to shape the bed and sideslopes leaving small ridges and imperfections. A small garden roller was used to try and smooth some of these out. A new reinforced polyester mat (Terrafix 270R) was used to avoid the stretching problem which has occurred in the first installation.

Dyna-Liner after one season's use in badly cracked concrete lined canal.

Metering of this trial section will be carried out to ascertain "n" values sometime in the 1987 irrigation season. It is expected the "n" value will be somewhat higher than the "n" value found in the concrete section lined with Dyna-Liner.

Cost for supplying and installing Dyna-Liner (including earthwork) in the unlined channel was about $10.00 per square metre.

The District points out that Dyna-Liner installations are in the very early stages of evaluation, however, if our readers wish to obtain more information please contact Mr. Earl Wilson, P.Eng., of the Eastern Irrigation District, P.O. Box 8, Brooks, Alberta, T0J 0J0 at telephone (403)362-4532 or Mr. Keith Strong, Dynamic Water Conveyances Inc., P.O. Box 374, Brooks, Alberta, T0J 0J0 at telephone (403)362-8878. ■

WATER: ON THE CUTTING EDGE OF TECHNOLOGY

Hydraulic Energy Replaces the Jackhammer

The mind jarring, bone rattling pneumatic jackhammer may soon go the way of the Dodo bird. A revolutionary ultra-pressure 2410 bar (35,000 psi) waterjet based cleaning, cutting and scarifying system has been introduced in Canada by Canadian Ultra Pressure Services Inc. The Edmonton based firm, under the direction of owner/manager Gordon Chapman, uses a water-jetting technique which first originated in Germany, but was refined and commercialized in the United States in 1984.

Chapman's first introduction to water-jetting was disbelief. One that most people have as their first reaction when told that a tiny jet of water with abrasives can cut through 100 mm of steel. The traditional method of removing damaged concrete is with the jackhammer. However, this body jarring method all too often leaves the remaining surface bruised, with loose aggregate and thousands of micro-cracks. On the other hand, a waterjet operator leaves a surface profile that is much better for adhesion of the new concrete.

While conventional cleaning guns operate at pressures in the 680 bar (10,000 psi) range, discharging water through fan-jet tips with flow rates generally exceeding 40 L/min (10 gpm). Chapman's waterjet system relies on low flow, 14 L/min (3 gpm) ultra high water pressure concentrated as pencil-thin jets to cut, spall and lift virtually all materials.

Flexible high pressure hoses allow the system to be operated at pressures as stated earlier at 2410 bar (35,000 psi). Operation at even higher pressures, up to 3790 bar (55,000 psi), is possible where rigid high pressure tubing and articulated joints or coils are used.

To further increase waterjet cutting capabilities, abrasives can be added to form an abrasive waterjet system. To quote from the U.S. Waterjet Symposium paper entitled "Cutting With Abrasive Waterjets" held at the University of Missouri in Rolla, "Water is pressurized up to 60,000 psi and expelled through a sapphire nozzle to form a coherent, high-velocity jet. The waterjet and a stream of solid abrasives are introduced into the specially shaped abrasive-jet nozzle from separate feedports. Here, part of the waterjet's momentum is transferred to the abrasives, whose velocities rapidly increase.

Handheld jetwand removes bad concrete and leaves the good concrete intact.

The momentum transfer between the waterjet and the abrasives is a complex phenomenon consisting of several components. One of the mechanisms by which this occurs is associated with the limited dynamic stability of the high-pressure waterjet. The initially coherent waterjet breaks into droplets that accelerate the solid particles. A second mechanism corresponds to the hydrodynamic drag forces imposed by the water phase on the solid particles.

As a result of momentum transfer between water and abrasives, a focused, high-velocity stream of abrasives exits the accelerator nozzle and performs the cutting action. Cutting or controlled depth penetration of the target material occurs as a result of erosion, shearing, failure under rapidly changing localized stress fields, or micromachining effects, depending upon the specific properties of the material being cut. The cutting rate can be controlled by adjusting the feed rate, the standoff distance, the waterjet pressure, or the abrasive parameters."

The ability of a skilled operator to quickly remove concrete to expose the reinforcing steel should leave many applications for this service in repair of cracked or damaged irrigation structures. For more information please contact Mr. Gordon Chapman, 4311 - 76 Avenue, Edmonton, Alberta, T6B 2H7 at telephone (403) 468-4724.■

A.I.P.A. MARKS FORTY YEARS

The Alberta Irrigation Projects Association, or A.I.P.A. as we all know it, marks its fortieth birthday in 1987. Formed early in 1947, this interest group has done a remarkable job.

By 1946, an important transition had occurred, whereby the original promoters of irrigation, headed by railway companies, had withdrawn. Irrigation projects were in disarray. Officials of existing projects soon realized that individual Irrigation District "cap in hand" approaches were not getting them anywhere in dealing with Senior Governments.

At their organizational meeting (early 1947), it was unanimously passed that the group would be called "The Alberta Irrigation Association", (it would not be officially known as the Alberta Irrigation Projects Association until it was officially incorporated in 1966). The members present at this meeting were to add much to irrigation in later years. These included P.M. Sauder, C.S. Clendenning, Ted Sundal, D.W. Hays, C. Asplung, R.H. Dahl, A.T. Johnson, G.S. Brown, E.N. Francis, S.P. Blair and E.W. Brunsden.

Membership in the A.I.P.A. is limited to the thirteen Irrigation Districts of Alberta. For each 50,000 irrigable acres, or part thereof, a District can appoint one director to the group. An executive is elected from within. To give the Association annual operating capital, each District contributes on a per acre basis (4¢ in 1987) for every irrigable acre within their own District. Mrs. Diane Virostek is the group's Secretary-Treasurer and is the only paid employee.

To summarize the history of the A.I.P.A., one might say that the 1940's and 1950's were decades of trying to get Senior Governments to recognize irrigation for its worth to the Province and to educate the general public of the importance of irrigation and its contribution to the agricultural well being of this Province.

During the 1960's, through many meetings and resolutions and persistent perseverance on the part of the Association, people began to recognize the many benefits generated through irrigation. Actual progress was beginning to show as a cost-benefit study was conducted, a new Irrigation Act came into being and a cost sharing formula was devised, setting the stage for the 1970's.

In the 1970's both Provincial and Federal Governments began to participate financially in rehabilitation of the worn out irrigation systems. The seventies was a decade of progress, when irrigation systems began to be rehabilitated, internal reservoirs were constructed, headworks were given uplifts and long range plans for the 1980's were drafted.

The Association has continued its work in the 1980's with great success and it is optimistic that the 86%-14% Cost Sharing Program will extend into the next decade.

The Alberta Irrigation Projects Association has demonstrated they are the united voice of Irrigated Agriculture in the Province. But as the 1980's begin to fade, the Association is embarking on an awareness program. Everyone here, in the heart of irrigation country, knows how important irrigation water is to our farms and the economy. But this is not the case in areas outside irrigation boundaries, for they have not been made aware that it is an investment that benefits all Albertans — be they farmers or city folk — for generations to come. Happy Birthday.■

MISSING CREDIT

In our 1986 Fall Edition of the Water Hauler's (Volume 25) concerning the article on the largest shallow drainage project in Alberta's history, we neglected to give Alberta Environment credit.

This article properly recognizes the participation of CH2M Hill Engineering Ltd. and the Drainage Branch of Alberta Agriculture in the project. However, no reference was made to the fact that the upgrading of the SMRID main canal system, including this project, is administered by Alberta Environment, with funding made available through the Heritage Savings Trust Fund, Capital Projects Division, under the Irrigation Headworks and Main Irrigation System Improvement Program.

Thank you Mr. Pat Duffy, Project Manager, for bringing this oversight to our attention.■

ART OLSON OFF TO OTTAWA

Dr. Art Olson

Southern Alberta native, Dr. Art Olson, is off to Ottawa to assume a new position with Agriculture Canada. Olson, who was raised in the Cranford area (Taber Corn Area) on an irrigated farm, has taken over the assistant deputy minister's job in charge of its research. He is leaving after 17 years of service in Alberta Agriculture where he rose to the position of Assistant Deputy Minister, Research & Resource Development.

In his new role, Dr. Olson is responsible for over 40 federal research stations in Canada, including the department's largest here in Lethbridge. He also supervises operations for all research institutes in Ottawa. Olson's operating budget is in excess of 240 million.

Olson, 44, graduated from the University of Alberta in 1967 with a Doctorate in Plant Biochemistry, took post-graduate studies in Molecular Biology at McMaster University in Hamilton, and began his professional career in 1968 as a biochemist research scientist with Atomic Energy of Canada. He returned to Alberta in 1970 as Director of the Alberta Horticulture Research Centre in Brooks. In 1974, Olson moved to Edmonton and became Director of Plant Industry. In 1979 he was named Assistant Deputy Minister, Research & Operations and in 1983 was named A.D.M. responsible for Research & Resource Development.

"The biggest problem I'm going to have is dealing with my loyalty and respect for the people I have worked with," he says. "When you leave, you leave people you have known for many years. I've been here a long time. I've had an opportunity to grow here. And you never do it alone. There have been many doors opened for me and I feel I owe those people something."

Olson says while it is hard to leave the Department, the federal posting was an offer he couldn't refuse.

"This offer to go to Ottawa is an opportunity for change," he says. "Personally, the timing is right and the job opportunity is an important one. It's an opportunity I'd like to try on for size."

Although Alberta's native son has left, we are sure his thoughts won't be too far from Alberta Agriculture Research.■

ORGANIZATIONAL CHANGES IN ALBERTA AGRICULTURE

Doug Radke

Mr. Ben McEwen, Deputy Minister of Agriculture has announced some Department changes as a result of Dr. Olson's resignation and the abolishment of the position. Doug Radke, former Assistant Deputy Minister of Planning, Economics & Administration, will head the new Sector, Planning & Development, which will encompass most of the units formerly under Dr. Olson.

Mr. McEwen announced that Radke will "maintain his responsibility for the Planning Secretariat, Economic Services, and Systems Development. Added are the resource development divisions of Resource Planning, Irrigation & Conservation, and the Irrigation Secretariat. These units move intact, except that the Soil & Crop Specialist, plus technologists located in Brooks, are transferred to the staff of the Horticulture Research Centre". Research will report directly to the Deputy Minister.

Radke graduated from the University of Alberta with a Political Science and Economics Degree and has a Masters in Public Administration from Carleton University in Ottawa. He initially joined Alberta Agriculture in 1968, and served in various positions, including secretary and member of Alberta Agricultural Products Marketing Council, and as an executive assistant to the Minister of Agriculture.

In 1975 he left Agriculture to join the Department of Transportation where he became chairman of the Alberta Motor Transport Board. Then in 1979, he joined the Grain Transportation Authority in Winnipeg as Deputy Coordinator and assumed the role of Acting Coordinator when the Grain Transportation Authority's first coordinator (Dr. Hugh Horner) resigned in 1980.

He returned to Alberta and the Department of Agriculture in 1982 when he assumed the position of A.D.M. of Planning, Economics & Administration. In 1983, he was appointed to the Board of Directors of Alberta Terminals, and in 1984 to the Board of Directors of Alberta Grain Commission.

Although many of us have not yet had the chance to meet Doug Radke, he is well known throughout the Province and the rest of Canada.■

SEMINARS FOR MANAGERS / BOARD MEMBERS OF IRRIGATION DISTRICTS

SEMINAR I: February 19, 1987 (Workshop)

1. The Board, Chairman, Manager Relationship - by Lethbridge Community College Instructor.
   - the relationship and understanding of functions and roles to allow for an effective and efficient administration.
2. Implementation of Policy and Management of Field Staff - by Harvey Campbell, Manager, Eastern Irrigation District.
   - what approach should be used to implement a policy through Field Staff such as the Ditchrider.

SEMINAR II: February 27, 1987

1. Effective Meetings - by Grant Fletcher of the Lethbridge Community College.
   (a) A Board's Member involvement.
   (b) A Board's Chairman
   (i) involvement
   (ii) responsibility

SEMINAR III: March 6, 1987

1. Legal Limits and Liabilities of Individual Members of the Board of Directors.
   - includes case studies.
2. Legal Limits and Responsibilities of the Board of Directors.
   - by Gerhardt Hartman, Irrigation Secretariat and Tom MacLachlan, Virtue & Company.

These seminars are sponsored by the Alberta Irrigation Projects Association, Project Planning Branch, Alberta Agriculture, and the Lethbridge Community College, and will be held at Ericksen's Family Restaurant. There is a $40.00 registration fee (which includes lunch) for each seminar. For further information, please call the Division of Continuing Education at telephone (403) 320-3323.■

WATER HAULER'S BULLETIN SUCCESS

Communicate your resourcefulness by having an article published in the Bulletin. Its success depends upon your help in obtaining and submitting new and useful ideas.

THE WATER HAULER'S BULLETIN

Designed to provide the operation and management personnel of Irrigation Districts with items of interest in their line of work. Comments are welcome. Please contact Duncan Lloyd, editor, at Area Code (403) 381-5164, Lethbridge.

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