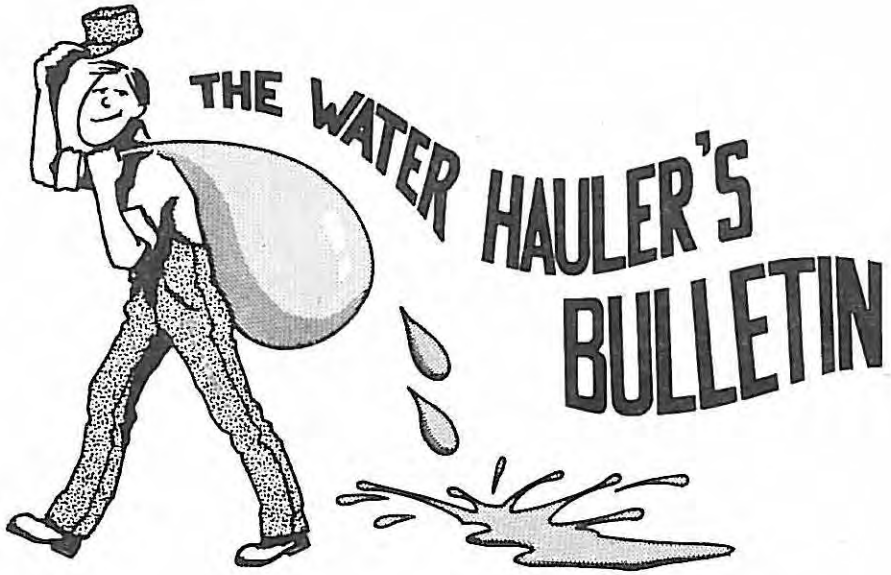

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C. J. McANDREWS RETIRES

After 35 years of service to Albertans, Mr. C. J. McAndrews is retiring from the position of Assistant Deputy Minister (Development Sector) Alberta Agriculture. To list all the accomplishments this man has made for the Department and his community would take the entire bulletin and then some. However, the Bulletin would like to take this opportunity to express its appreciation to Cy, for all the time and effort he has spent in helping Albertans through his work, as well as, being a very willing and able person on the various irrigation trusteeships, community boards and associations, and church groups.

The Department is organizing his retirement party for February 4, 1983 in Edmonton. However, a social evening (dinner and dance) is being planned for anyone wishing to honor Cy and his wife Joan on January 21, 1983 in Lethbridge. For more information, please contact Mr. Akos Pungor or Mr. Gary Hartman at 329-5140.

* * *

PERMA-LOC: A NEW IRRIGATION PIPE

Manville Canada Inc. is now manufacturing at Fort Saskatchewan, Alberta "Perma-Loc" a spiral wound PVC pipe.

Perma-Loc is presently available in 450 mm (18"), 525 mm (21") and 600 mm (24") diameter sizes. All size diameters are in 4 m laying lengths. A full line of accessory fittings such as Tee's, wyes, and elbows are available.

The flexible rubber ring is factory installed in a "locked in" position on the spigot end to produce a water tight seal to resist infiltration and exfiltration.

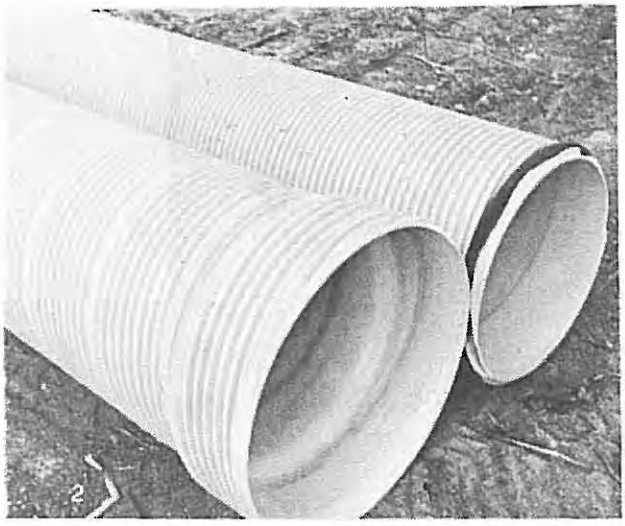
Perma-Loc is a lightweight pipe (a length of 450 mm diameter weighs 82 kg).

The spiral wound pipe will deflect no more than 7½% when recommended installation and compaction techniques are followed. "The inside wall is very smooth and Manning's 'n' value of 0.009" are reported" by Kip Campbell, sales representative with Manville Canada Inc.

Each length of Perma-Loc is air tested at 20.7 kPa at the plant before shipment.

Campbell reports the first Perma-Loc for irrigation is being installed for the Lethbridge Northern Irrigation District by McNally Contractors of Lethbridge.

For more information please contact Kip Campbell of Manville Canada Inc., telephone 261-4080.



Exclusive Ring-Tite joint assures a tight seal according to Manville.

The performance of any flexible conduit does not depend only on the class of embedment materials used but more importantly, on the density of the material in the haunching zone.

* * *

DITCH WEEDS

Irrigation systems spread weeds. Weeds add a cost of hundreds of thousands of dollars annually. The control of weeds along canal right of way is an important part of controlling the spread of these weeds. If you don't believe me please read on.

Thousands of years ago when I was young, weeds along canals and laterals were left to farmers cows or to seasonally employed company staff with scythes. The weeds were seen merely as site specific problems, not as the locus of infestations of system wide proportions.

Then, as now, these weeds were seen as company problems as is evidenced by recurring questions at the district annual meetings. There are a few still alive who can remember when yellow buttercup wasn't a canal bank weed, but those oldtimers invariably recall it coming from upstream or having first seen it near the diversion or some such other location.

It's true that many weeds are now so widespread that they are as common as dandelions so it might seem that no weeds could possibly be left to be spread by our delivery system. However, showy milkweed is a current invader that is spread by the water itself or by our trucks and maintenance equipment. I can't think of any successful system wide approach to automatically prevent weed spread. It's true that trash removal devices which may be called weed screens can help but really their objective is to prevent floating material from plugging the system.

The water user has screens on the intake of his system which prevents damage to his equipment but does not prevent the proliferation of weeds.

So it seems much of the burden of weed control will fall on the shoulders of those who read the Water Hauler's Bulletin. The method of control or hopefully eradication are not much different than those carried out in adjacent cultivated lands. Because of the quasi-public nature of irrigation the public expects a high standard of performance in the area of vegetation management.

Obviously, the problem begins as soon as the system is built, so too does the control of weeds. Because of the complexity of the problem and the different site specific situations a few solutions won't solve all problems.

Please contact Blair Shaw at 329-5124 for help with your weed problems.

* * *

AGRIVISION

Be sure to watch Agrivision with Co-hosts Don Wentz and Len Ring on Tuesdays, Channels 2 & 7 at 10:30 p.m.

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TRACER TAPES V/S TRACER WIRES

In a recent article of the Water Hauler's Bulletin (Volume 8) we reported on the use of tracer wires to locate buried non-metallic pipelines. Since the time of the article's appearance, we have been informed about two other products, "Detect-A-Tape" from Allen System, Inc. and "Terra Tape" manufactured by Reef Industries Canada Ltd.

Terra Tape (see attached sample) is manufactured of inert polyethylene with a one mil metallic foil core and is resistant to alkalis, acids, and other destructive agents found in the soil. The tape has printed on it continuous warnings such as "Caution Water Line Buried Below". Tapes are available in: 1000 foot roll lengths; widths from 2 inches to 18 inches; and various colors.

Detectable Terra Tape, with its metalized core, can be detected with standard pipe locating equipment. For the most effective protection, Terra Tape should be installed in the pipe trench slightly below the depth which farm equipment is capable of reaching. Its advantage over wire is that if someone digs it up, they know immediately there is an irrigation pipeline below, and might not think they have just dug up a buried wire.

For more information please contact Len Ring at 329-5152 or Duncan Lloyd at 329-5164.

Protects

Locates

Identifies

* * *

DITCHRIDER'S COURSE ANYONE?

The Lethbridge Community College (LCC), Irrigation Projects Association and the Irrigation Division are jointly sponsoring a five day Ditchrider training course from February 14 to 18, 1983. Anyone interested in participating in this short course should contact the LCC at 320-3323 immediately.

* * *

UPDATE ON CONCRETE CANAL CRACKING

In late November 1982 an inventory of cracking was recorded on 12 km of unreinforced concrete lining and 20 km of wire mesh reinforced concrete lining. This inventory involved all of the reinforced lining in W.I.D., B.R.I.D., T.I.D., S.M.R.I.D. East & West, and L.N.I.D. Spot checks were made on unreinforced lining in B.R.I.D., T.I.D., S.M.R.I.D. East & West, and L.N.I.D. Comparing the inventory taken in November 1981 on the unreinforced linings, it was found that overall, few new cracks have evolved, however, the vertical displacement of existing cracks is increasing. On the wire mesh reinforced linings, the cracking that did occur was transversely across the lining and was found, in most cases, to be half way between expansion joints.

Of the linings inventoried in November 1982, an average of 65.5% of the unreinforced concrete lined canals has cracks and an average of less than 1% of the wire mesh reinforced concrete lined canals has cracks.

NOTE: It may be unfair to compare average percent of cracking of the 2 linings since the unreinforced sections were constructed sometime earlier than the reinforced linings.

* * *

WATER DELIVERY MANAGEMENT

The present delivery system whereby the demand method is implemented allows the Irrigation District up to 48 hours to meet the farmer's request for water or cutoff of water. In many cases, and especially in the longer canals (over 80 km long) with many laterals, the District can meet the variable flow demands on time only by having an excess flow (or waste) in the canal nearly all the time. Some spillage cannot be avoided but the excess to meet variable demands can be reduced.

An improvement in water management can be achieved by providing checks with automated gates in the canal. Manually operated checks can be very time consuming to adjust properly even if they are provided with gates. Perhaps the least complicated system is where the gates adjust to maintain upstream water level. This method also stores water in the canal system. An extra flow of water from the headgate raises the water level at the first check, causing the gate to open further. This allows a new water level to travel downstream as a bore wave. This sequence is carried out from check to check to the point where the extra flow is needed. Since there is a potential head upstream of each check any variation of depth is propagated through the canal by a bore wave action rather than by actual water travel. This is more rapid than the normal rate of flow of the canal so the adjustment occurs quickly.

Another method that is perhaps more expensive requires remote telemetric monitoring of water depths or flows and central control of flow along the canal. In this case the instructions either to raise or lower flow through headgates and checks are done simultaneously and the extra flow is taken from storage or the reduced flow goes into storage until the canal system adjusts to the new rate of flow. This adjustment occurs quite rapidly because of bore wave action.

Both systems save water for most long canals but the latter system has the advantage of keeping constant watch of the flow as it controls it from a central location.

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LOW PRESSURE AIR TESTING OF INSTALLED PIPES

Uni-Bell Plastic Pipe Association has now developed specifications and testing procedures using a low compressed air pressure of 20.7 kPa (3 psi) to detect any leaks in low pressure pipelines.

Several miles of new pipelines are being installed each year in the Irrigation Districts. The majority of these pipelines are gravity pressure operating under very low pressure or no pressure at all. The pipes are made from concrete, PVC, polyethylene or fibreglass and have bell and spigot joints with rubber gaskets of various shapes.

Leaks are a common problem both in the irrigation and sewer industries and are usually discovered when the pipelines are in operation. Wet spots on the ground surface indicate a leak, however, this does not necessarily mean that the leak is located directly below. In some instances, leaks would remain undetected.

Past attempts at testing for leaks were made by plugging the line and filling it with water which produced a hydrostatic pressure. Obviously, hydrostatic pressure was highest at the lower end of the pipeline and negligible at the upper end. If a leak was detected, the pipeline had to be excavated and repaired, consuming valuable time and money. Sometimes, when the pipeline was constructed at the end of the irrigation season, the test had to be performed the following spring.

Uni-Bell's new method uses an air compressor and dual pneumatic polyurethane plugs which fit inside the pipe over the tested joint. Air is pumped in to 20.7 kPa and held for a specified time. Consequently, contractors are able to test each section of pipe rather than no test or random testing. Just three sizes of plugs can cover six pipe diameters.

Another procedure is to plug the pipeline at the end of each day's construction and air pressure testing the line for a specified time. By using this method, the contractor knows when a leak is detected and would be in the section installed that day. *The suggested formula for this type of testing procedure is:

$$T = 0.085 \frac{DK}{Q}$$

Where: T = time during which pressure must not drop by more than 6.9 kPa (1.0 psi)
K = 0.000419 DL, but not less than 1.0
Q = 0.0015 cubic feet/minute/square feet of internal surface
D = nominal pipe diameter in inches
L = length of pipe being tested in feet

Complete air test procedures and specifications are available from Uni-Bell, or contact Kip Campbell at Manville Canada Inc., phone 261-4080.

Equipment for air testing is available from Canada Valve Supply, Edmonton (phone 962-6655).

Low pressure air testing is safe, economical and can be initiated quickly and easily. A much tighter joint can be turned over to the owner and everyone benefits from the positive air tests - the contractor's pride in his workmanship and the owner knowing he has a good working product.

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*Formula reprinted from Uni-Bell Plastic Pipe Association Bulletin, UNI-B-6-79.

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T.V. INSPECTION OF IRRIGATION PIPELINES

The Applied Research Section of the Project Planning Branch started a video inspection program for irrigation pipelines after concern was raised by an irrigation district that there was no means of knowing why flow capacities were reduced in pipelines.

In 1981 and 1982, 12.5 km of pipelines were classified and inspected under the research inspection program. Previous reports have been published in the January and Summer 1982 issues of "The Water Hauler's Bulletin". In total there has been 7140 m of polyethylene, 2324 m of PVC, 825 m of fibreglass and 2216 m of concrete inspected by an Edmonton firm - IS Inspection Services. In the fall of 1982, 2.4 km of irrigation pipelines were inspected with 1133 m of polyvinyl chloride, 1075 m of concrete and 173 m of polyethylene. One additional PVC pipeline was inspected under an irrigation district's own contract. This inspection revealed bad deflection in an area of deep cut and replacement with a more rigid pipe was required.

Under the Irrigation Division inspection program in 1982, the following results were obtained:

Concrete pipelines inspected: The 915 mm ø line was in very good condition (except for one pulled joint which created a seepage area). The 760 mm ø pipeline showed several leaking joints. These joints in the 760 mm ø line had been repaired previously but without success. An actual hole was present at the side of one section of the pipe creating a seepage point.

PVC pipelines inspected: These PVC pipelines were very clean and in good condition. Both pipelines were of 305 mm ø. One pipeline had a 30 m section where the deflection class was between 15% and 25%.

Polyethylene pipeline inspected: Only 173 m of 305 mm ø polyethylene pipeline was inspected as the tow rope broke and could not be refloated. Over half of this portion inspected had a deflection class of between 25% and 50%.

Water infiltration through wall of 760 mm ø concrete pipeline.

From literature and all design information a deflection of 15% and over is considered to be the point where concern is warranted. There are four deflection classes we have chosen to categorize the pipelines. They are as follows:

0 - 15%	Deflection - normal pipe condition
15 - 25%	Deflection - poor condition, failure possible in future
25 - 50%	Deflection - very poor condition, almost a failure
50 - 100%	Deflection - failure

For 1981-1982 these are the total inspection results according to deflection classes:

	% Of Pipelines With Deflection			
Pipe Material	0-15%	15-25%	25-50%	Over 50%
Polyethylene	77%	14%	8%	1%
PVC	97%	1%	2%	
Fibreglass	90%	10%		

For concrete pipelines, joints were observed to have problems in 5.2% of all cases including leaking joints, misalignment or pulled joints.

The results indicate that compaction and proper construction procedures are essential to solving problems associated with buried irrigation pipelines. A higher ring-stiffness for plastic pipe should be seriously considered when the choice of material for pipelines is made.

The inspection program is helping to pinpoint problems associated with buried irrigation pipelines and eventually may lead to new designs and better installation procedures to avoid future problems.

* * *

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 at 329-5164, Lethbridge.

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