TESTIMONY OF THE WATER CAUCUS OF MANITOBA ECO-NETWORK

to

MANITOBA CLEAN ENVIRONMENT COMMISSION

with respect to hearing on

PEMBINA VALLEY WATER COOPERATIVE:

Prepared by

DAVID B. BROOKS, KIMBERLY BALLANCE AND GLEN KOROLUK

Revised 06 November 2006

Introduction and Summary

Our presentation today focuses on two aspects of the request by Pembina Valley Water Cooperative (PVWC) to withdraw water from aquifers in the Sandilands area and convey the water by pipeline to its distribution area consisting of 18 communities (one city, seven towns, one village, and nine regional municipalities). According to our understanding, the additional water is mainly needed for peak deliveries for municipal (mainly, residential) use during summer months. Our main goal is to call your attention to apparent gaps in the material that has been made available to the public for review. Because of the short time available to us – only five weeks between award of intervener funding and this hearing – and the unexpected cancellation of the later hearings, we do not pretend to be presenting definitive information. However, we do assert that our information should raise serious enough questions to reject the proposal at this time. Our three points are as follows:

1. First, we shall raise concerns the financial costs of the project in relationship to likely returns in the form of consumer payments for water. Based on the information available to us, we conclude that the project cannot be built and operated in order to yield anything approaching conventionally acceptable rates of return. In one way or another, the project is likely to require subsidies from the public or from the member municipalities. The only alternative to such subsidies is to increase water rates to the nine municipalities that "own" PVWC and that buy bulk water from it (as well as to a number of industries and other direct consumers of the coop). However, adoption of this alternative presents the PVWC with a Catch-22 of its own making, for, were rates to final consumers (mainly households) be raised commensurate with the increased cost to the municipalities, consumption of water would very likely be reduced, which would in return also jeopardize a sound rate of return.

2. Second, we shall question the whole basis for expectation of large and necessary increases in water use in the PVWC distribution area. We argue that there is no reason to assume such expected increases in residential demand. (Because the term “domestic” is used differently by PVWC and by Water Stewardship Manitoba, we avoid its use.) Further, with appropriate policies and programs directed to water conservation, as described in a brochure that will be distributed to Panel members, current use rates might well decline. In contrast, we will show how “potential need” might indeed go down in future years, or at most remain stable.

3. Third, we wish to raise questions about land use and water use in the PVWC area. Because the two must be closely linked in management decisions, it is quite possible that a reduction in water demands could be achieved by re-thinking past land use decisions. In particular, it appears that this area has shifted from a time when over 30 or more years when investment in infrastructure was designed to get rid of water to the present time when investment in infrastructure is proposed to obtain more water. Coupled with these decisions are major with-without decisions about the future of livestock in the region, and particularly about involving hogs and pork.

Throughout our testimony, we are reflecting the general information that has been made available on the PVWC and on its distribution of water to nine municipalities. In particular, we are responding to the proposal from PVWC to increase its available water supply by building an approximately 90-km pipeline to the Sandilands area, with the increase justified by current or projected need to respond to summer peaks in water use rates. Most of that summer peak is, according to the proposal, coming from“municipal” uses, which predominantly reflects use by individual households, as delivered through systems managed by the regional municipalities. In particular, we shall challenge the statement in the Cochrane Engineering report of 2003, which reads, “Domestic projections represent a potential need that must be satisfied.” This statement misstates the situation in several respects and, more importantly, it is inappropriate as a basis for sustainable water management.

Our specific conclusion that the evidence does not justify construction of the proposed pipeline is reinforced by the gaps in the materials submitted in support of the proposal by PVWC. Its submission is inadequate by failing to test the “no project” alternative – that is, a scenario in which the PVWC distribution area would get along with no additional water. The “no project” alternative is expected as a matter of course in any benefit-cost analysis and is required in most environmental impact assessments. Our general conclusion is that communities in the Pembina Valley (and elsewhere) should no longer rely on withdrawing new water as their approach to water management. Instead they should begin from the position of “No New Water” and rely on demand management as a cheaper and environmentally safer alternative.

<u>Part 1: Project Financial Costs</u>

It has been difficult for us to determine the cost of the pipeline apart from other elements of upgrading of the PVWC distribution system. A number of sources have suggested that the wells in the Sandilands Provincial Forest area and the 96-km pipeline to Morris, Manitoba, where it would enter the existing PVWC network, would cost on the order of $11 million. For the sake of this brief analysis, we will assume that this is the investment required to build the project. To be conservative, no allowance will be made for environmental costs or mitigation of environmental damages other than those that would normally be made in construction projects. We will also assume that no charge is made for water withdrawn from the aquifers. (In principle, there is no reason why water withdrawn for sale should not pay a royalty to the public, just as do those who pump oil or natural gas.)

An annual cost for carrying and protecting the investment in the wells and pipeline can be estimated very roughly by adding two figures. Typical interest rates for commercial loans over the past decade have been about 10% per year. Current rates are lower but this figure is a good average of what PVWC might encounter over project life. We have no direct information on annual costs for operations and maintenance, but, again, a commonly used estimate in pre-feasibility studies is 10% of investment cost. Simple multiplication than indicates that annual costs for interest on loans and to manage the wells and pipeline will be approximately $2.2 million per year ($11 million * 0.2).

The initial withdrawal rate for water is set at 50 litres per second or 4320 cubic metres per day or 1,576,800 cubic metres (1,577 cubic decametres) per year. Dividing the annual cost of $2.2 million by the annual withdrawal of about 1.6 million cubic metres gives a direct cost of $1.40 per cubic metre. This is more than many people in Canada pay for all the water and more than about one-third of the communities in the PVWC distribution area are paying for water delivered to their homes. By the time the water from the Sandilands pipeline gets to the final users, it must be moved from Morris through the PVWC to their own communities, where it is sold, and then distributed through a local network. Given the administrative costs and lack of economies of scale that are a normal aspect of local water supply, It would be surprising if costs did not double in this process.

Given the various conservatisms in these calculations, we simply question whether the proposed pipeline is a wise investment. Of course, people in the PVWC distribution area could be asked to pay higher water tariffs in order to ensure full deliveries of water in summer droughts. There are two reasons why this may not be acceptable. For one things, residential consumers in this area are already paying water rates that are high by comparison with other citizens of Manitoba. For another, peak residential water usage in the summer is generally regarded as the most flexible and most easily reduced form of water use. People are willing to pay higher rates for drinking and cooking water, but not necessarily for water to grow grass or wash cars.

Part 2-A: Water Use and Conservation Potential - Definitions

We accept the Cochrane report of 2003 as an appropriate engineering analysis as a guide to technical options for PVWC to consider for upgrading of its infrastructure. In contrast, we do not accept that the report offers appropriate socio-economic analysis as a guide to potential future water use for the public to consider. (Our concerns focus almost entirely on Section 2 of the report: Growth and Demand Projections. The reference throughout is of course to water use.) Problems start with terminology, for two pairs of terms are used, seemingly interchangeably, in the report despite the fact that each member of the pair represents a different concept. The differences between them are substantive, not just semantic:

- The first pair of terms is “scenario” and “projection.” What are regularly described in the report as scenarios” should instead be called projections. A scenario, a term which comes from the world of the theatre, offers alternatives based on a story line, including stories in which key conditions and relationships change and surprise events occur; the results of scenario analysis are rich in ideas but they do not provide mathematical precision and additional analysis is needed to suggest how likely any scenario is. A projection, in contrast, is a highly constrained “if-then” analysis that indicates how today’s conditions would change if specific, well-defined changes occur in a few key variables (typically extrapolated one at a time); the mathematics is precise but with only presumed cause and effect relationships and, just as with a scenario, nothing in the math indicates which projection is more or less likely.

- The other pair of terms is “demand” and “consumption.” Consumption is a statistic that indicates the amount of water used in a sector or for a specific purpose. Demand, in contrast, is an economic variable that reflects the range of consumer’s desire for water (or, when aggregated, consumers’ desires for water) depending on price, income, available, technology and a host of other factors. The projections in the Cochrane report show possible future rates of consumption. They do not show future demand. In particular, they assume no change in the price of water to consumers and no change in the equipment people use in water using activities..

As a second point of criticism, in the section entitled “Summary of Growth and Demand Projections,” the authors of the Cochrane report write, “Domestic projections represent a potential need that must be satisfied.” Nothing could be further from the truth. Ironically, the section title uses the term “projection” correctly but then mis-uses the term “demand,” which should be consumption. Worse yet, the phrase shifts from both demand and consumption to “needs,” and then asserts that needs have to be satisfied. There are two reasons why this statement is wrong. First, consumption rates do not indicate “needs,” as that term is generally used. Consumption includes everything from drinking water, which everyone would define as a need, to washing automobiles, which hardly anyone would so define. Second, with the exception of a very limited range of water uses, mainly restricted to household uses for drinking water, cooking, and sanitation, few needs have to be satisfied. There are many ways of providing water-based services with less water and some alternatives that do not require any water at all. The rest of this part of our testimony will elaborate on this point.

<u>Part 2-B: Water Use and Conservation Potential - Calculations</u>

The purpose of this section is to sketch out an alternative scenario (in the sense defined above) that will indicate why projected consumption rates may not in fact occur, and why the proposed pipeline is not be needed. In effect, this is a preliminary test of the “no project” option that was not explored at all in the proposal from PVWC. It also reflects the position that, with but few exceptions, high rates of household water use are not a need that has to be satisfied. The approach taken in this section is described in more detail in the brochure by Brandes and Brooks entitled “The Soft Path for Water in a Nutshell” (2005), which should be treated as part of this testimony. The annex to this brochure gives a more detailed outline of how to proceed with the kind of analysis that we are demonstrating in our testimony today. Some of the same points are mentioned in the PVWC Water Conservation Plan (1998), as prepared by earthbound environmental Inc. However, that plan is not particularly comprehensive, and, in any event, it is not clear if (or to what extent) it has been put into practice. It is also not clear what proportion of final consumers in the PVWC distribution area are metered and are paying by volume. The information that we have indicates that the proportion of households that are metered is increasing, but that flat rates and even some declining block rates are also common, particularly for larger commercial and institutional establishments. Though metering of end users is not the responsibility of PVWC, evidence is clear that metering and charging for water per unit taken (ideally with increasing block rates) has a significant and continuing effect on rates of water consumption.

In the first part of this analysis, we will make a number of simplifying assumptions, most importantly no increase in the price of water to consumers. We will also assume that householders in the PVWC distribution area are similar in their water use patterns to householders in other parts of Canada. And we will assume that water use is constant over the course of a year. As will be seen, relaxation of any of those assumptions makes the case against the pipeline stronger, not weaker.

According to Environment Canada, typical water use rates inside a Canadian household are as follows. (Uses outside the house will be treated separately below. The average rates for Canadian water use cited in the Cochrane report combine inside and outside uses.)

Bath and shower	35%
Toilet	30
Laundry	20
Cooking & drinking	10
Other	5
	100%

Every review of which we are aware has shown that, without significant loss in the quality of the service, water use for these purposes can be cut by one-third. By “quality of service,” we mean that the user would not notice much if any change in the role water is playing in his or her life. To be specific, if anyone were advocating a return to the outhouse approach to sanitation, all water use in the toilet could be eliminated, but only with a significant loss in the service. A return to the outdoor privy is ***not*** the kind of change that is under consideration here. (Sanitary and effective indoor waterless toilets are available, but we are not pursuing those options in this preliminary analysis.) However, more efficient toilets, which not only cut water use per flush but that also reduce the rate of leakage from tank to bowl certainly are under consideration here. Typical Canadian toilets use 12 to 15 litres per flush. Newer dual-flush toilets that have been tested and approved at 6-3 litre standards (ie, 6 litres for a heavy flush and 3 for a lighter flush) are available on the market and, in terms of system costs, more than pay back their costs over their lifetimes. Total water savings for this use are conservatively 50%, or about 15% of total water use inside the house. (Think about how many more times the light flush will be used over the course of a day, and each flush is a 75 to 80% saving in water use.) There is also the “costless” approach to saving toilet water by putting a brick in the tank (better, a plastic bottle of water, as it does not flake and leave a stain) will also work, but less effectively. The new toilets are more than just a minor technical adjustment. As well as offering dual flushing mechanisms, newer toilets have been totally redesigned to optimize water flow, to ensure that one-flush empties the bowl, and to reduce seals that can leak as they age.

With the exception of use for and drinking, similar rates of saving can be found in each of the other uses with simple technical and very modest behavioural changes. More imaginative (and more costly) changes, such as capture of rain water for laundry use or recycling of gray water (wash water other than that from the toilet), can go much further. New developments in Sydney, Australia, have been built with an 80 percent reduction in water use per home. In short, there is no reason to assume that high rates of household water use are a need that must be satisfied. The Cochrane report does in fact offer two sets of calculations for future water use rates, one based on the highest rate found in the region (in Altona) and the other on moderates rates (in the town of Carman and the city of Winkler). Unfortunately, neither set is based on evidence. A fully developed scenario approach would have justified the higher rates on the basis of expected additional water using equipment and new demands, or, alternatively, justified the lower rates on the basis of gradual replacement of old equipment in favour of newer more efficient equipment, and perhaps growing consciousness of limitations on water availability among consumers.

Let us now relax the assumption that water use in households is constant over the course of a year. This is far from the case. During summer months, water use typically doubles, which means that, apart from relatively small increases in the number of baths and showers and in laundry water, half of all water use is occurring outside the home. The main uses are for lawns and other decorative plants and for household gardens, with secondary uses for swimming and wading pools, car washing, and general hose cleaning. Each of these uses helps to make summer more pleasant, and they are something that Canadians value highly. However, they are not “needs” in the usual sense. Moreover, if anything, they offer an even greater potential for conservation. The most obvious is to replace part of all of the conventional lawn with drought-resistant ground cover that, at least after the first year, requires no watering. Another is to ensure that whatever rainwater falls in the summer is appropriately directed to uses around the house and is not just channeled to a storm drain. (Many houses already do this.) Still a third is to ensure that gardens are not watered in direct sunlight and that, where possible, simple drip rather than hose or sprinkler systems are used. None of these adjustments eliminates the service desired, even if it is the simple enjoyment of growing plants; they just provide the service with less water.

The importance of this attention to summer use rates outside the house is precisely because these uses, which can easily be reduced, are exactly those that cause the PVWC to experience a peak summer demand. Given that outside uses are half of all use in the summer, gains of 30%, which are readily achievable, translate to an overall reduction in use of 15%, gains that would occur right at the time that they are most valuable to the PVWC. Further, to relax the assumption about pricing, evidence is strong that water use outside the house are much more sensitive to price than uses inside the house. The point here is not simply higher prices for water but rather smarter pricing patterns. If summer peaks are a problem, it makes sense for PVWC to charge more for that water, particularly during the day. If so, PVWC must also expect that the higher prices will themselves work to reduce the peak demand, just through the normal working of the market.

Finally, because we do not have enough information to know how the agricultural and irrigation water is used in the PVWC distribution area, we have simplified the analysis to now by assuming that all of the increased water that would be supplied by the pipeline is for household use. We understand that PVWC is not mandated to supply irrigation water, and therefore that part of the assumption will not be relaxed. However, data on actual distribution rates show that some proportion of the water goes to non-irrigation agricultural uses, which includes stock watering, washing, cleaning and other on-farm operations, which do not vary much over the year. If large animals are allowed to graze outside in the summer, use rates may even decrease slightly. Without being more specific, the point is that the extent to which some of the summer peak demand is coming from farm operations reduces the volume of water that has, to now, been attributed to households in the analysis above. Further, because the value of water for farm uses is typically well below its value in residential uses, the benefits of peaking water are thereby further reduced. Still further, to the extent that PVWC water is used on the farm, the system is incurring unnecessary cost by upgrading water to drinking water standards when the on-farm uses do not require such high-quality water. It is increasingly common for water utilities to deliver two qualities of water with higher quality water delivered to households and lower quality water used for other purposes, mainly irrigation. The lower quality water has been treated to ensure it does not carry disease vectors, and it is even used in urban parks (typically through differently coloured pipes from those carrying potable water).

Part 3: Land Use and Water Use

All land use decisions have implications for water use, and those in agricultural areas have particularly important implications. We did not have sufficient time to develop a water balance for the PVWC distribution area, but it has clearly been altered by past efforts at re-molding land to optimize on-farm operations and to ensure efficient drainage. The net effect of those investments has been to reduce the water available within the area. Given that the area typically receives 55 to 60 cm of precipitation per year, most forms of farming should be possible without irrigation. Though PVWC does not deliver irrigation water, analysis of the current water balance might suggest opportunities to shift water from one use to another. With current allocations of 7415 cudams per year (the sum of surface and ground water and of spring and summer flows), irrigation is already a sizable term, second only to municipal.

Before major new investments in water infrastructure are made, we recommend a careful look at current land use patterns, with the objective of determining how better use could be made of current, natural water flows. To what extent could the amount of water available for irrigation use be increased by adjustments in the drainage systems either by directing the water into ponds or by recharging aquifers? To what extent could that water be used to replace water current used for stock watering and other on-farm uses that do not require potable water? To what extent is the water needed to protect ecosystems and support environmental values?

Finally, there are major questions in our minds about the future of industrial agriculture in the PVWC area, including notably the raising of hogs and production of pork and the use of irrigation to produce potatoes. These types of operations are water intensive, and as such they raise longer term questions about patterns of development and particularly more sustainable development and more sustainable rural communities than we have had in the past. We are not asserting that such operations are inherently bad, but we do say that they require enough water to require explicit public decisions. The fact that the operations may be privately profitable does not necessarily make them publically desirable, and particularly not when the water is available at low or no cost. These sorts of questions should be considered before commitments are made to potentially misdirected investments in new water supply. Public decisions about water use for household use are very different from those for industrial use, and possible needs for the former should not later be used to prepare for the latter.

Conclusions

In summary, we believe that the summer peak use rates that PVWC is using to justify the construction of the pipeline can be cut significantly by relatively simple adjustments in the equipment that provides water services to householders. Coupled with increasing consumer awareness of the need to conserve, those rates could be cut even further. We therefore see no rationale for constructing the pipeline.

Please note that, in this analysis, we have made no allowance for environmental considerations. Our analysis has focused entirely on cost effectiveness of water conservation as opposed to additional water supply. Attention to environmental values would of course further support the conclusions we reach on narrower grounds.

Finally, though we do not have the information necessary to test this hypothesis, we suggest that the differences between pipeline construction costs and the conservation alternative are so large that it would be less costly for PVWC to subsidize consumers to retrofit their water using equipment and to install low-flow toilets and other equipment than to build the proposed pipeline. The appropriate analysis would compare the investment cost of the pipeline per cubic metre of delivered water versus the investment cost for partial subsidy of consumer equipment per cubic metre of water saved. (Water rates typically cover only operating and maintenance costs for the water they use, not capital costs. Therefore, water utilities are in a stronger position to offer subsidies as their costs will go down by considerably more than those of final consumers.) These sorts of options, combined with scenarios based on vigorous water conservation, need to be tested. The “no project” alternative appears to be very robust indeed.

-x/0\x-