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### GROUNDWATER IRRIGATION AND WELL INTERFERENCE POLICY: A Three-State Comparison

During the 1970's, well-interference emerged as a highly volatile policy issue in the allocation of groundwater in states bordering the humid East and the arid West.

Well-interference is the lowering of water levels in wells adjacent to or neighboring a high capacity well during and shortly after the time the high capacity well is being pumped. It is generally a temporary hydraulic phenomenon, as distinguished from long term overall lowering of the water level in an aquifer caused by pumping exceeding recharge.

States such as Iowa, Minnesota, and South Dakota have experienced dramatically increased groundwater irrigation since 1970. Although the actual number of cases of interference in these states is relatively small, significant political impact resulted largely from widespread public unease about the adequacy of water supplied during the drought period of 1974-76.

New irrigation wells interfering with existing domestic wells caused most conflicts. The drought and rapidly increasing groundwater irrigation, caused all three states to review and revise groundwater allocation policies. The revised rules have not received much attention by the public, in practice or court. This kind of attention awaits another drought like that of 1974-76.

Because of the lack of public attention and the policies' potential importance, we examined Minnesota's well interference policy compared to South Dakota and Iowa policies, in light of their likely economic effect.

#### MINNESOTA POLICY

Groundwater use in Minnesota is regulated by its Department of Natural Resources (DNR). About 20 percent of the text of DNR's agency rules governing water appropriation deal with procedures to avoid or abate the problem of well-interference.

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add one--groundwater

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The basic intent of Minnesota's policy appears to be to force large users to compensate for damages caused by their pumping.

Applicants for permits to pump groundwater for irrigation must detail the location of their well. When DNR does not have "adequate" information to estimate drawdown and effect on existing wells, the applicant must conduct a test by pumping the well for at least 24 hours while observing drawdown and recovery in one or more observation wells.

Test information is used to predict interference effects in nearby wells. If any neighbor will likely be deprived of water for any period of time, DNR may not issue a permit until the applicant provides an acceptable plan for abatement or compensation of all potentially damaged parties.

Even though a new irrigator has a permit, any affected party can file a complaint with DNR which must investigate all complaints. Substantiated complaints require restriction or suspension of the permit by DNR until the permittee reaches an agreement with the affected parties.

### Efficiency and Equity of Minnesota's Policy?

Several aspects of the law contribute to its equitable and efficient administration:

(1) Irrigators who must compensate neighbors for damages to their wells have the incentive to consider these "external costs."

(2) Increased production from irrigation is allowed to occur because the irrigator may negotiate compensation with damaged neighboring well owners. In some states a person suffering damage can stop irrigation completely.

(3) The usually difficult task of estimating damages from well interference is left to the affected parties on the basis of approximately equal bargaining power; no party has monopoly or veto power; and the party who feels his/her opponents are unreasonable may appeal to impartial arbitration.

### Criticisms of Minnesota Policy

The policy does little to reduce uncertainty on the part of the irrigating producer. Irrigators must incur most investment costs as part of the application process and issuance of a permit does not guarantee that problems will not result in its suspension. However, pumping tests may permit anticipation of problems. Furthermore, these costs are very likely much cheaper than those that would result from litigation in the courts under other policies.

add two--groundwater irrigation continued

### South Dakota Policy

South Dakota's procedures are similar to Minnesota's. Applicants for high capacity well permits must submit locational and geological information on their proposed wells to the Department of Water and Natural Resources (DWNR).

DWNR evaluates the application on several grounds, including the likelihood of well interference. The information and analysis are not as detailed as in Minnesota because South Dakota's existing hydrologic information is more extensive. DWNR recommends approval or disapproval to the state Water Management Board (WMB).

If an "adequate," domestic well will likely be interfered with, the Commission will not approve the application. The key question is what constitutes an adequate well. While Minnesota protects all existing wells, South Dakota protects only "adequate" wells. Generally, an adequate well must fully penetrate the aquifer and have its pump set just above the screen. Many existing wells do not meet the legal standard of adequacy since good well construction practice did not require full penetration of the aquifer before irrigation became widespread.

The owner of a damaged well not meeting the adequacy standards has no protection and must bear all the costs of interference. If an adequate well would be interfered with, a permit is not issued to the high capacity well owner who then has no recourse. The WMB may issue the permit to the owner of an interfering well if he reaches an agreement with the other party. However, South Dakota law does not encourage or require bargaining. Adequate domestic well owners hold a near absolute veto power. High capacity wells remain shut down unless domestic well owners are satisfied with an offer of compensation. Similar procedures apply to interferences not predicted during permit application but which materialize later.

### Efficiency and Equity of South Dakota Policy?

This policy more likely results in an "all or nothing situation." Interference with an affected "adequate" well may prevent use of water for irrigation. In that case, the South Dakota policy results in loss of agricultural production that could have been produced with irrigation. However, interference with a "non-adequate" well results in a transfer of income from the owner of the affected well to the irrigator.

add three--groundwater irrigation continued

### Iowa Policy

Public concern about groundwater development in Iowa led to a three year near-moratorium on the issuance of new permits in the mid 1970's. New permits issued are now for only one year. Nevertheless, Iowa has no formal well interference policy. The problem is not specifically mentioned in any Iowa statute or agency rule.

The Iowa Natural Resources Council (INRC) gets well interference cases on an ad hoc basis. Where well interference from irrigation may occur, permit applications can be denied because of inadequate water supply. A formal assessment of well interference by a regulated user through aquifer tests is made in only a small number of cases. When parties to a well interference complaint cannot reach a private agreement, the INRC investigates but the extent of the investigation depends on the nature of the facts in the complaints and upon substantiation of a complaint it may terminate the permit.

Iowa has no formal mechanism for arbitration or bargaining for compensation. The INRC can terminate the permit or not, but it cannot order abatement procedures or compensation. If either party to the dispute is dissatisfied with INRC actions, the only recourse is the state courts under common law rules. This is viable but costly for the damaged party. The high capacity user (irrigator) may be denied access to water on grounds that he feels are unreasonable.

Avoidance of well interference disputes may also have been a factor in Iowa's ban on groundwater irrigation from an aquifer from which there was a lack of basic hydrologic information.

### Efficiency and Equity of Iowa's Policy?

(1) Iowa doesn't have a defined policy and this uncertainty could act as a disincentive to irrigation development.

(2) The cost of settling disputes in court is much greater than the costs of settlement by arbitration or private bargaining. This extra cost is simply a loss to society.

From an equity standpoint, damaged parties may settle for substantially less than the actual amount of loss to avoid the hassle and high cost of court action. On the other hand, when interference by an irrigator is substantiated by the INRC, and permit suspension is threatened, the party who's well is damaged holds a virtual "veto power" and may force the irrigator to pay more than actual damages to obtain consent for the use of the well.

add four--groundwater irrigation continued

The Bottom Line

Minnesota, South Dakota and Iowa policies distinctly differ in their approaches to the volatile problem of well-interference by irrigation. It is economically desirable to obtain increased crop production from irrigation. And we believe, as a result of our study, that the Minnesota policy is the most efficient and equitable of the three to the extent that it simultaneously encourages irrigation and protects non-irrigation groundwater users. Minnesota's administrative regulations are preferable to costly, time consuming court settlements. We also favor that aspect of the Minnesota policy that limits the dollar damages the agrieved party can extract from an interfering irrigator to an approximation of the actual damages.

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