

# Ecological Flows (Newsletter)\*

November 4, 2009

The concept of ecological flows dates from at least the mid-1970s. It is becoming an important issue to everyone who withdraws ground or surface waters, injects water underground, or adds water to streams and rivers. At the federal level, the US EPA funded a grant to The Nature Conservancy to define ecological and related flows and create methods to measure them and the US Geological Survey is working in New Jersey to develop measurement methods. There is a major effort to define and regulate peak and ecological flows in the Sacramento River system and Oregon has just passed into law requirements that peak and ecological flows be maintained in any projects funded by state grants or other assistance. New Zealand, Denmark, India, and other countries either have incorporated such stream and river flow requirements in national laws or are in the process of doing so. Consideration of these flows is now a requirement for funding by the World Bank.

The major problem for natural resource industries is not the lack of science behind this idea but the plethora of science that can easily overwhelm decision-makers. That there is no consensus on methods of defining, measuring, or modeling ecological and related stream and river flows is a reflection of the highly site- and organism-specific considerations that need to be fully considered. Regulatory impacts include water right allocation decisions, discharge permit application decisions, and diversions among different basins or from surface waters to ground water storage and subsequent withdrawal.

There are two scientific issues and one technical consideration involved in addressing peak, ecological, and other flow requirements. The scientific subjects are aquatic biology/ecology (organism flow requirements by life cycle stage and interactions of the biotic and abiotic ecosystem components) and fluvial geomorphology (channel and sediment size/quality shaping and maintenance). These two are very tightly linked and must be considered as a single subject. The technical (but not scientific issue) is that of resource allocations; policy decisions such as water rights that are difficult to make because of competing valid interests (in- versus out-of-stream uses of the water).

In both agency rule-making and permit application decision processes, these flow issues will play large roles in the timing, cost, and uncertainty of

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environmental permitting and other regulatory approvals. It is reasonable for us to expect that environmental NGOs and groups opposed to natural resource operations will use the inherent high variability of biotic and channel structure requirements to delay or deny operations. The political and legal issues of water right grants and water resource allocations are complex and difficult to decide. The scientific issues are very complex both in themselves and in explaining them clearly and effectively to non-technical decision-makers.

Because this is still a new and developing concern for natural resource industries it is worth while for you to consider now its implications for your current and planned operations. The investment in gathering relevant information and contingency planning could well turn out to have very high value to you in the future.