

Senator BIRMINGHAM: We will come back, Mr Freeman. How does the authority believe the key ecosystem functions of the resource are determined—again, by reference to the treaties, or is there greater scope for judgment on what they are?

Mr Freeman: As I said, I believe that that is an area of greater judgment, so there are the key ecosystem functions of water resources. The others are places; assets are places and they have been recognised in these agreements. Functions are less acknowledged. So what do you require to have a healthy ecosystem function? Clearly you would want areas of high and low flow. You would want areas of flow that actually created habitat—deep holes and sandbanks and things are important in river systems. You want above-bank flows to get out on to the floodplain to water those vegetation communities that are part of the Ramsar and other conventions. But I believe that there is scope for the authority to develop those in its own way. We put forward four functions that we believed were critical for the functioning of these riparian systems. If there were science that came forward and said there was a fifth, we would then have to model that and see whether that required extra water requirements, which you would then have to source through SDLs. So I believe there is more scope with regard to functions, as it is not a precise answer like a place.

Senator BIRMINGHAM: In relation to productive base, when considering that there is a very direct consideration of at least the economic circumstances of that base, I assume—

Mr Freeman: Yes, the authority actually took legal advice on the definition of productive base, because it is a term that could be interpreted in multiple ways. It is actually issues such as water quality that underpin both the economic and environmental basis of the water resource. What this is requiring us to do here is determine the environmentally sustainable level of take and, with regard to productive base, it would be water quality et cetera, which is essential not only for the environment but also for economic use of water. It is those other things that may not be volume based that underpin the water resource, and quality is an easy one to relate to.

Senator BIRMINGHAM: Is there a potential within that definition of 'productive base' to argue that, if you reduce the number of rice growers in an area to such a level, in fact you eliminate the potential productive capacity of that region?

Mr Freeman: No. The legal advice that we have is very clear that the productive base is not the economic base of that water resource but actually the broader productive base in both an economic and environmental sense.

Senator BIRMINGHAM: Lastly, on key environmental outcomes for the water resource, are there things that are not ecosystem functions or key environmental assets or factors that relate to the productive base that get roped in under that catchall phrase at the end?

Mr Freeman: I think we have been given some opportunity to express those other things in a broad way. Under the environmental outcomes, for example, there is the need to export salt and nutrient out of the river system. They probably do overlap—

Senator BIRMINGHAM: Although that is just as easily captured under (c) or (b) isn't it?

Mr Freeman: Yes, that is correct. As you are implying, (d) is less definitive than the environmental asset point. But it is there as a very broad term.

Senator BIRMINGHAM: As we have gone through each of those, we have not managed to find an area in which upfront consideration in the definition is given to economic or social factors, have we?

Mr Freeman: What I have said is that the amount of water required that will not compromise those things does allow for economic and social considerations. The identification of assets, functions and the productive base tends to be science driven. The assessment of how much water you need includes a range. As the authority said in the guide, if the Water Act was purely about the environment, the amount of water that we believe needs to be returned to the river system to make it healthy from an environmental perspective would be 7,600 gegalitres. But the act does not stop there. The act allows you to take into account economic and social considerations, and hence the range that was put out in the guide was 3,000 gegalitres to 4,000 gegalitres.

Senator BIRMINGHAM: Is there a capacity within a particular key ecosystem function—let us say that you need the river to run pink once a year or something totally abstract—to say that the economic cost of achieving this one key ecosystem function is too great and therefore we may need to compromise on it?

Mr Freeman: There are degrees of meeting these functions. While it might be optimum to have water out on the flood plain every second year, for instance, the authority has had to look at what the impact on those environmental assets and functions would be if that occurred only every third year in order to reduce the economic and social impacts. The questioning tends to be about where we meet them or not. The authority has to