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Mr Geoff Chapman,  
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Re: Consultative Document on Spectrum Trading

Dear Geoff,

I am pleased to be able to provide you with the Water Industry response to your Consultation Document on Spectrum Trading.

### INTRODUCTION

This response is provided by CSS Spectrum Management Services Ltd., on behalf of the Telecommunications Advisory Committee (TAC).

TAC is Chaired by Mr Mike Halliwell, of the Environment Agency.

TAC has been established for over 10 years and represents the interests of the United Kingdom Water Industry on a range of matters related to Mobile and Fixed Communications and Radio Scanning Telemetry.

The membership is drawn from representatives from the following Industry Groups:

10 Water Service Companies

15 Water Supply Companies

Scottish Water

Environment Agency

Dept of Regional Development Water Service Northern Ireland

The Water Industry (WI) has been a major user of Private Business Radio systems. They operate a limited number of analogue trunked radio systems. In addition, increasing use is being made of Public Cellular, provided by the UK Service Providers on the GSM 900 and GSM 1800 systems.

The Water Industry is also a major user of licensed Radio Scanning Telemetry systems which are designed and assigned to the IR 2037, VNS 2111, RA375

(previously the MPT 1411 specification). Both the PBR and Scanning Telemetry spectrum is self managed under a National Channel arrangement.

The Committee has provided input into the various stages of the Spectrum Review and the resulting Consultative Documents leading to the 1998 WT Act and the various Consultations which have followed.

Management and support for matters related to Water Industry mobile communications and Scanning Telemetry are provided by CSS Spectrum Management Services. This relationship provides the RF engineering and planning necessary to ensure that the most effective, efficient and equitable use is made of the radio spectrum. It also acts as a focus for the Industry and deals with financial matters related to RA, DTI and Oftel.

CSS also act as the common point of contact for the equipment manufacturers and Service Providers.

In liaison with the TAC membership, CSS has developed a Water Industry Mobile Communications Strategy for the medium and long term.

The day to day spectrum management of the PBR and ST bands is carried out by CSS Spectrum Management Services who also collect the license fees and deal with all licence issues.

## SCOPE OF THE CONSULTATION

The members of TAC have recognised the need for effective use of the radio spectrum. This has already been demonstrated by the sharing of spectrum and radio systems over the past twelve years. The members have recognised the benefits offered by the introduction of Spectrum Pricing and have supported the Radiocommunications Agency with their development of the detailed pricing options in a number of areas.

### **General Issues**

The Water Industry is keen to be innovative and move forward in all aspects of communications. The Industry supports in general terms the opportunities that spectrum trading could offer. The members of TAC do however have concerns on how this process might affect their ability to meet their statutory duties under the Water Act.

The increasingly stringent quality standards and health related issues are overseen by the Water Industry Regulator Ofwat.

The regulations under which the Industry operates have a considerable impact on the Capital programs that the industry is allowed to undertake and the standards of services that the Industry is required by statute to meet and maintain.

All large capital schemes have to form part of their long term plans and have to be approved by Ofwat.

There is concern that the ability of the companies to operate at a cost-effective level is not jeopardised by manipulation of the spectrum trading process. As discussed in the

consultation document it is anticipated that the market will drive the costs of the spectrum. When organisations have made very considerable investment in their equipment and systems, they could be faced with no option but to pay the price. However this is not acceptable as the systems were adopted on the basis of existing spectrum costs. This approach may be attractive to the holder of the spectrum but would not be to the advantage of the country as a whole. The demise of British Energy who are in financial difficulty is an example of an organisation who is constrained due to regulation. In the Water Industry mobile communications and telemetry are fundamental in order to meet those requirements. In many organisations scanning telemetry is now an integral part of their operational systems. Without these systems some Organisations would not be able operate at a cost effective level.

In view of the actions on September 11<sup>th</sup> 2001, security, which has always to be of prime importance now has an even higher profile. Telemetry plays a major role in the areas of Health and Safety as well as general security.

The Industry, are concerned that spectrum trading cannot be used in a way which might jeopardise their long term ability to serve the Public and deliver the service in a cost effective way.

## **RESPONSE TO QUESTIONS**

### *Question 1*

*Do you have any comments on the proposed modes of trade? Are there others that should be considered?*

In principle the various modes address the opportunities for trading and form the framework which can be developed by discussion and consultation on each specific sector or sub block of spectrum.

When combined, the six modes provide total freedom to manipulate the use and type of trading that is possible. Although these are outline proposals it is important to confirm that there will be a check list of criteria which must be met when the mode of trading is being selected.

The choice of mode is fundamental to the long term value of radio services to all users in order to ensure that the needs of all sectors of the market are recognised and protected in the longer term.

The choice of mode must be based on the net benefit to the user sector of the spectrum and not just the commercial opportunities for a financial investment. It is however accepted that in an environment of commercial competition separating these drivers may be difficult.

The Water Industry fully supports a progressive approach to the introduction of spectrum trading subject to a clearly defined and measurable criteria.

### *Question 2*

*How should interference disputes be resolved? How far should Ofcom become involved and what should its role be in relation to interference?*

For some time the Water Industry, through its support organisation, CSS Spectrum Management Services has dealt with the majority of interference issues centrally. Once it has been established that the interference is not being generated from within the Industry, the problem is then passed to the Radio Investigation Service (RIS). This process works because the WI members recognise that it is in the interests of all members to ensure that the spectrum is kept interference free.

This will not be straightforward when a number of different organisations are involved. This will be more complex if technologies are also mixed within a band of spectrum, as a result of the change in use of the license. The resolution of interference becomes more complex when different organisations use the same spectrum but some distance apart. It is essential that if an interference issue cannot be resolved locally and quickly that there is an independent body to take over and manage the problem. To do this they will require some statutory powers similar to those of the RIS.

We think that it would be naive to think that disputes that involve two or three different users of spectrum licensed from a number of different licensing organisations will not be difficult. It could be very similar to trying to resolve an IT problem, the software writer blames the equipment supplier, they blame the network, the help desk tries to get them all to talk!

We suggest a two level approach:

- 1 Initial tests and verification of the assignments within a specified time scale.
- 2 Fault passed to an independent body, such as the RIS to identify and direct the offending party to resolve the problem and then to advise all parties of the outcome.

### *Question 3*

*It is proposed to give scope for trades with as wide as possible a variety of time periods and opportunities for reversion. Which combinations do you think will deliver greatest benefits?*

At this stage it would be difficult to quantify this arrangement. Due to the investment required in mobiles, base stations and the necessary infrastructure there will be a minimum time required to recover the initial investment and provide a return on the capital.

There will also be a need to provide a minimum percentage allocated for shorter term use.

The issue of revision would appear to be necessary as the long term management is set by the “mode of trading” for that spectrum.

The actual frequency of the spectrum in question has an effect on how it could be used and the time scale required to make its use economically viable.

The principle of variety and flexibility in relation to this topic is supported, the detail and timescales must be decided at the time the band in question is released for spectrum trading.

*Question 4*

*It is proposed to give scope for trades where the extent of transfer of rights and obligations is complete or concurrent. What is your view on this proposal?*

The key issue in relation to this question is the obligations under any complete or concurrent transfer of right.

Within this process there should be a requirement to certify that there are no known problems or issues in relation to this spectrum both inside and outside the area of licensed operation.

This approach should ensure that the responsibility for any border line assignments remain with the organisation that made the original assignment and thus ensure any questionable assignments are avoided.

There is an element of risk associated with this approach as it could, in effect, break up contiguous blocks of spectrum.

Within the sphere of spectrum management, more effective use can usually be made of contiguous blocks of spectrum under the control of the same spectrum manager.

It is important that at some point in time the opportunity exists to be able in effect to start again, perhaps when technology has developed further.

*Question 5*

*License classes from the following sectors are proposed for a first wave of the introduction of spectrum trading: public wireless networks; broadband fixed wireless access, private business systems and terrestrial fixed links. Additionally for the first wave the simplest mode of trading (change of ownership only) is proposed for all other license sectors and licence classes (with a few exceptions).*

*a) What is your view of these proposals?*

*b) What is your view on the appropriate timing of the introduction of trading for particular license classes within sectors, and in particular for Third Generation Mobile (3G) licenses?*

The formation of Ofcom will bring with it a considerable number of challenges and opportunities.

During the initial stages it is important to retain an element of stability in the provision of services and the way in which the new organisation will manage the wide range of tasks it will have to perform. The country faces a radical change in the method of regulating a number of sectors and at the same time is considering a major change in the way regulation and licensing of radio based communications is handled. In view of this, stability of the services and not speed of introduction should be of the essence.

The introduction of spectrum trading will have a learning curve and a period when experience gained can be used to improve the next sector to be considered.

Running the introduction of spectrum trading into a number of sectors in parallel could cause difficulties or lost opportunities which could be difficult to integrate into other sectors if they are also being developed.

As public wireless networks and broadband fixed access services are in the early stages of their development and introduction, they may benefit more from spectrum trading than the more established systems.

The spectrum used by PBR systems and terrestrial fixed links tend to be more established and more stable, and so on the surface would appear to offer less initial benefit.

However there is considerable experience in the external management of the spectrum in various sectors of the bands used by the Utilities. For the Water Industry this is undertaken on behalf of the Telecommunications Advisory Committee (TAC) by CSS Spectrum Management Services Ltd., and for the Fuel and Power Industries, by JRC Ltd.

This sector might provide the lowest operational risk to the current Users and the RA/Ofcom.

#### *Question 6*

License classes from the following sectors are proposed for a second wave of spectrum trading: *sound broadcasting (analogue and digital), television broadcasting (analogue and digital), programme making and special events, and aeronautical and maritime. What is your view of these proposals?*

For the process of Spectrum trading to deliver a net benefit while ensuring good spectrum management it is important that the process is introduced in a number of phases so that as lessons are learned and experience is gained these can be applied to the next sector of the market in order to improve the overall trading process.

The sectors proposed for the first wave in some areas should be relatively straightforward but there are a number that will be more difficult to manage in such a way that they deliver the objective of improving the effective use of the spectrum without using the process solely as a means of generating revenue for the Treasury or other organisations.

This response links closely to question 5. It is our view that there would be a level of risk and a lost opportunity if spectrum trading were introduced into a number of sectors at the same time.

A sector by sector approach would be better in the longer term.

In view of the range of spectrum used for program making and special events it might be more appropriate to deal with this as the first stage of the second wave.

#### *Question 7*

*In your view, what is the best approach for introducing the more complex forms of trading?*

The more complex forms of trading can only be based on the results and effect of the simpler trading.

From the experiences in other parts of the world the take up has not necessarily reflected what might have been expected.

In view of the current downturn in certain sectors of the Communications Industry it is not realistic to identify the more complex areas of opportunity at this time.

In the longer term these needs should be identified and spectrum trading introduced in a way that supports the real requirement.

The need for complex trades is accepted but market “needs” should be used to drive this process forward when appropriate.

#### *Question 8*

*What is your view on the overall timing of the introduction of spectrum trading?*

When Ofcom is formed it will require a period in which to settle down and identify areas of responsibility and to build relationships with their customers. The thread running through the consultation document is that there will be further discussions. One would also assume that Ofcom will have to develop strategies in relation to the individual areas of radio based communications. In view of this it is recommended that a period of 12 months should be allowed before the introduction of a pilot scheme.

Subsequent sectors should initially follow in a sequence, one at a time, to ensure that lessons learned are incorporated into the next sector.

When the process is proven to be delivering the benefits, then a number of sectors could then be introduced at the same time. One might expect to reach this situation in three to five years.

It is felt that the introduction of spectrum trading should not be rushed as once the process is in place it would be difficult to return to the status quo.

If users suffer interference and considerable capital has been invested in equipment, commercial organisations are likely to seek financial redress.

#### *Question 9*

*In planning for the introduction of spectrum trading, it would be helpful to have an estimate of the likely volume of trading. For each license sector and license class on which you can express a view, what volume of trades would you expect? Would you expect a different volume depending on the available modes of trade?*

There could be a number of drivers for trading spectrum.

For organisations that need to expand their current service or ease congestion they may wish to purchase additional spectrum capacity. This situation will not develop overnight and so one could consider one or two trades per year. If an organisation is considering installing a new system over a large geographic area they may have no option but to buy access to spectrum, subject to a long enough period of guaranteed access. There are not many large PBR systems being installed in the current climate due to financial constraints and the wide range of alternative communications options. The number of trades are likely to be driven by the spectrum required. For example there is little call for low band VHF but there is considerable interest in the UHF spectrum.

At the GHz end of the spectrum the relatively limited range of the signal provides more options for trading, but within a band good spectrum management should ensure that normal users will still have the opportunity to obtain a license.

#### *Question 10*

*For the proposed license sectors from which license classes will be selected for the first wave of the introduction of spectrum trading with more complex trading modes (i.e. for the sectors: public wireless networks, broadband fixed wireless access, private business systems and terrestrial fixed links) do you have any views on how extensively change of use or reconfiguration should be permitted?*

In some instances the present incumbents have invested in their current systems on the basis that the spectrum they use has been allocated for that use. The current equipment and technology may not be able to co-exist with different technologies.

One would expect that public wireless networks, broadband fixed wireless access, may benefit from complex trades, provided that they do not restrict the current investment.

The packing density and large number of different users in the PBR systems and to a lesser degree terrestrial fixed links, would make complex trades more difficult in this sector.

#### *Question 11*

*For the proposed license sectors from which license classes will be selected for the second wave of spectrum trading, do you have any views on how extensively change of use or reconfiguration should be permitted?*

The organisations in the second wave tend to be large and are underpinned by complex communications infrastructures. They have in effect been controlled by a firm licensing regime.

Trading in this sector needs to be co-ordinated with the strategy for public service broadcasting. The formation of Ofcom will enable those issues to be resolved and the detail of which sectors should be traded and the controls required should be developed.

It is recognised that the considerable investment in the 3<sup>rd</sup> generation and the change in market trends requires a period in which the 3G operators can at least establish themselves and build a user base on the particular benefits of their offering.

We would support the proposed delay in the introduction of secondary trading in this sector and question whether 2004 is still too early.

*Question 12*

*Would having different trading rules for different license sectors and license classes have any undesirable impact?*

On the basis that the division between the sectors remain and are not lost due to long term changes in use, then it is considered that in certain sectors different trading rules would be required.

*Question 13*

*In what circumstances do you consider it would be appropriate for Ofcom to*

- (a) require prior clearance or consent (ex ante) for competition purposes for a proposed trade and*
- (b) withhold consent for a trade on competition grounds?*

**Answer A**

In many of the trades the block of radio spectrum is unlikely to be totally clear. Any major trade of large blocks of spectrum should, for the first four years be subject to an ex ante review. As stated earlier once a move has been made it is difficult to return to the status quo. In some instances there might be a temptation to move additional users into a band on the basis that the original user **should not** suffer interference. If they do, in this situation there might be little the original user could do. Once the process is underway and is seen to be working, the need to review large and complex trades could then be removed.

**Answer B**

In view of the long time scales that are involved with the introduction of some systems and the fact that once the spectrum is populated with users it can be very difficult to clear. In view of this it is considered that Ofcom should have the authority to withhold consent for a trade on competition grounds.

**Observation on Section 10**

In paragraph 10.3 the inference could be drawn that hoarding unused spectrum is not an issue unless there is nowhere else in the band for another potential user to go.

This would appear to be at odds with making the best use of spectrum. Under the current regime you **Use It or Lose It**.

If spectrum is not required, should it not be held in a pool at a standard licensed rate, as opposed to being held through a single source of supply?

*Question 14*

*How should tradable licenses be structured? Views on all aspects of structuring the licences would be appreciated including on the technical construction of boundary conditions.*

Ofcom must have an underlying duty to ensure that access to radio spectrum is available to all potential users, subject to them meeting a range of criteria covering standards, equipment, power, bandwidth etc.

Regardless of who has temporary ownership of the spectrum they must still offer a license with the minimum of restrictions.

The boundary issue is much more complex. It is affected by a number of issues:

- Frequency
- Type of Modulation
- Duty cycle
- Power levels
- Aerial type and height
- Level of received signal
- Topography

Access to adjacent boundary assignment information

The technical details of how the boundary issues should be identified and managed are too complex for this consultation. The Water Industry will be pleased to support the Radiocommunications Agency or Ofcom in the development of this topic.

*Question 15*

*Are there licence classes, or licence sectors, for which division of spectrum into predefined frequency trading units with fixed boundary conditions would facilitate trading?*

The key to fixed boundary trading is the frequency of spectrum and hence the re-use distance. The lower the frequency the more difficult is the task. In this planning scenario the transmitter power, aerial height and location within the trading area have a major effect on the reuse distance.

From a technical viewpoint it could be argued that the block by block approach is spectrally less efficient as artificial guard areas have to be included in the overall spectrum planning. It will in effect reduce the number of times the channel or block of spectrum can be reused. At the higher frequencies this is of course less of an issue. From this it could be concluded that fixed boundary trading is more viable at GHz frequencies.

At the lower frequencies the use of one, or a small number of larger spectrum management organisations would be more effective.

Again the Water Industry would be pleased to participate in the further development of this topic.

*Question 16*

*Are there licence classes, or licence sectors, for which user-negotiable boundaries would facilitate trading?*

In situations such as scanning telemetry where the systems although very heavily loaded are relatively stable, there could be an opportunity for user-negotiable boundaries to provide added value. However in view of the united approach that the WI has adopted and the high technical standard to which they operate their equipment, it would seem unlikely that there would be any advantage in trading this spectrum. The key to the high packing density is the way in which the Industry through its spectrum management organisation has organised the use and re use of the spectrum.

*Question 17*

*Are there licence classes, or licence sectors, for which spectrum reconfiguration on demand would facilitate trading?*

There are clearly some technologies that do not co-exist well in the same geographic area.

The current development of the new digital standard should enable this technology to provide a range of connection options while co-existing in the digital world. The flexibility being proposed by the standard should be a strong enabler to support the option to provide spectrum reconfiguration on demand in certain situations.

*Question 18*

*What changes, if any, do you consider are needed to licence term and security of tenure to promote the successful introduction of spectrum trading? Please be as specific as possible about the licence sector(s) and licence class(es) to which you are referring.*

When introducing a PBR communications system one might think that the main cost is the capital investment. On a large system there is a considerable overhead which can be in the order of 20% to install mobiles, train the end user and generate the documentation to ensure that all relevant members of staff know how to operate the systems and where to find the user information. In view of this it is felt that 7 years is the minimum capital life for a PBR system.

Scanning telemetry, once installed becomes an integral part of the organisation's operation. The effectiveness of a scanning telemetry system can and does effect staffing levels and methods of operation. In view of the procedure required to obtain authorisation for major projects and the high investment required in scanning telemetry equipment and its interface to plant

and equipment it is considered that a 10 year minimum term is required and 5 years notice to vacate thereafter.

The added value for trading spectrum in this band could stem from a situation where the number of channels available to a user within an area are all already in use, but another Utility may have unused channels in the area which are licensed under a National Channel license.

*Question 19*

*What are your views on continuation of annual licence fees for traded licences?*

If Ofcom are adding value to the process then there is a need for an annual license fee.

If the spectrum is being managed by a Spectrum Management Organisation that is in effect supporting Ofcom, there is value in charging an annual license.

In practice there will be a need for an “honest broker” situation from time to time. Ofcom will have a role to play in this, and as such will need to be able to access records and have the technical expertise to make unbiased decisions based on sound engineering and commercial information.

The efficiency with which Ofcom operates would affect this license fee.

If there is, what is in effect a single payment for an agreed period, the incentive for good spectrum management may be lost. This approach could also form the foundation for spectrum holding, as opposed to hoarding.

*Question 20*

*a) Ofcom could provide only a minimum level of information for spectrum trading (identification and some description of licensed spectrum, and ability to send a message to the licensee) and leave further information provision to the market, or Ofcom could provide higher levels of information. What is your view on the optimum level for spectrum trading of information by Ofcom?*

*b) What type of information would assist or encourage you to trade?*

*c) Should Ofcom have power to compel disclosure of market information?*

20A

Due to the fact that no matter how good the spectrum management may be it is the quality of the installation and the adherence to the license conditions which will ensure a clear and unfettered market for spectrum trading.

If Ofcom does not have an overall picture of the market it might be very difficult to manage interference from the small minority of users who may operate outside their license conditions. If the role of the RIS is to continue, their task will be quicker and more effective if they can access assignment data from a single point.

Ofcom should be able to advise what spectrum is available to trade and it should identify the current use of the spectrum and the proposed future use in general terms.

#### 20B

In order to consider what spectrum might be of value if tradable, the following information would be required.

Frequency

Current licensed use of the spectrum

Geographic area of license

Period for which spectrum will be available

Type of use or modulation used by other organisation in the same geographic area. e.g. FM, Digital or Broadband

If the spectrum is not used by other organisations in the local area, where is the next reuse within a 150km radius.

There must be a statement to advise that the spectrum is free of interference or subject to a defined level of interference.

#### 20C

In view of the current security situation in various parts of the world a degree of caution is required in relation to the general disclosure of information.

It is important that Ofcom retains the right to compel the disclosure of market information. However they should use this information for the overall benefit of the users and the disclosure of license information should reflect a previous consultation on “***Disclosure of Wireless Telegraphy License Information on Radio Frequency and Assignment Use***”.

Information should be presented in a format that does not disclose detailed location and customer information without discussing this with the user organisation.

#### *Question 21*

*Should Ofcom publish details of potential trades before they take place?*

During the initial phases of the introduction of spectrum trading Ofcom should publish details of potential trades. Until it becomes clear how large the trades are and the area over which the trade operates it is important that users can provide input before the transaction has taken place and any associated costs incurred. This approach is a good way of letting the market see how the process of trading is developing.

#### *Question 22*

*Are there topics other than those listed in Table two paragraph 17.1 that will need to be considered before Trading Regulations are finalised and trading is introduced for particular licence sectors and classes?*

1. Any restrictions on the use of the spectrum

2. A view from Ofcom of possible interference. This might come from Satellite or MOD systems
3. The financial stability of the organisation for longer trades
4. An agreement to comply with the license conditions when the trade goes ahead.

*Question 23*

*For licence sectors and licence classes in which you have an interest how would you like to see trading start?*

In view of the investment required in equipment and systems and the way in which radio based telemetry is essential for those organisations in the Water Industry that use it, if spectrum trading is introduced to this sector it should be introduced via the simple process, linked to self provision of spectrum management such as that currently organised by TAC.

*Question 24*

*What steps, if any, should the Government take to recoup capital gains realised as a consequence of the introduction of spectrum trading?*

The introduction of spectrum trading will require the trading organisation to invest in the necessary tools and equipment to manage the spectrum. Ofcom will have to ensure that these costs can be recovered by the trader without driving the price of the spectrum through the roof. This links closely to question 19 and the issue of an annual license fee for Ofcom.

The issue of capital gains assumes that the traded licenses will generate considerable sums of money. Ofcom should take a view on what is a fair price for the traded spectrum. The objective should not just be to raise money for the Treasury but to encourage efficient, effective and equitable spectrum management.

Any money over a pre-agreed amount should be used to support the blocks of spectrum which are not particularly sought-after but which have considerable value to the group of users that make use of it.

*Question 25*

a) What steps, if any, should Ofcom take to facilitate the start of spectrum *trading markets*?

b) *How can Ofcom assist the development of successful spectrum trading markets?*

c) *Do you consider that intermediaries are likely to emerge through the market if there is demand, or will Ofcom need to assist, and if so how?*

Question 25A

Ofcom should approach organisations who currently manage all or part of the spectrum they use and invite them to be one of the first organisations to start

spectrum trading. This could be viewed as a partnership and the organisation (s) could work with Ofcom to develop the day-to-day processes and draw up the necessary documentation to take the process forward.

#### Question 25B

The choice of the first organisations is critical. Ofcom must be able demonstrate that the framework process has been developed and is seen to work. The lessons learnt from the first trades can be offered to those organisations who have an interest in trading spectrum.

Ofcom must be seen to support the process and to be in a position to offer help and support through its experience in managing radio spectrum.

#### Question 25C

It could be that a two tier system of trading develops. The top tier would cater for large and relatively infrequent major communications systems, where spectrum is traded and a number of users may need to be **bought out**. The lower tier would cater for smaller trades that are likely to be fast and furious, based on short timescales and in many way similar to individual licenses.

It will be necessary to monitor the market and see how it develops. At this stage it would seem likely that intermediaries might need some encouragement and the introduction of a pilot scheme to illustrate how the arrangement will work and generate revenue.

#### *Question 26*

*Do you agree with the analysis in the draft Regulatory Impact Assessment?*

*Is there additional information or data you can provide to help assess either costs or benefits?*

Although Ofcom will not need to spend time to re-plan and re-farm spectrum, in practice the traders of spectrum will have to undertake a similar role in order to make the most effective use of the spectrum.

As stated earlier in our response, allocating spectrum coverage by blocks of coverage is very spectrally inefficient as it creates a large number of spectrum boundaries.

It may be easy to manage but does not maximise the use of the spectrum over a large area.

The advantage of centralised management is to fit as many users as technically possible into one area while providing them with an agreed service availability.

Over the last 4 years there has been a decline in the use of PBR. This has been recognised by the RA and they have tried to stimulate new interest by the good work that has been undertaken by the RA and FCS in their PBR into the Future Workshops.

It is not clear when the impact assessment was undertaken but in recent months the public mobile communications Industry has come under increasing financial pressure.

The demise of Dolphin Telecommunications also highlights the fragile state of the market.

The fact that the current license fees are based on half the bench mark figure and the market is nowhere near as buoyant as it was 2 years ago, tends to suggest that the RA probably chose the right value. The problems with the 5GHz spectrum also brings home that there are blocks of spectrum that are not valued as much as had been predicted.

## SUMMARY

There are opportunities for secondary trading, however the process needs to develop within a framework and in such a way that existing users do not suffer interference as a result of changes to the way in which the spectrum is managed.

Until Ofcom can confirm that the process is working and delivering value to the users of radio spectrum, the trading process should be introduced in a single sector of the Band and with caution.

There is a need for some rules to ensure that spectrum is not held for long periods i.e. when designing a system or as a means of encouraging the introduction of a particular type of technology in a specific band, which may be different from the current use of that spectrum.

There is a need to limit the time that such unused spectrum could be held.

The ability in effect to buy the spectrum over the heads of the existing users is of concern. This is why there is a need to publicise proposed trades.

In view of the Water Industry's concerns over the possible risks associated with the adoption of spectrum trading, it is the Industry's view that there is a need for an independent review organisation, external to Ofcom but which can review and make a judgement on the technical and commercial implications of specific spectrum trades if any party or organisation feels that they could be adversely affected.

The initial response to this document is complex, particularly as it now brings together a number of individual recommendations. The Water Industry is keen support the process and to ensure that the introduction of secondary trading benefits Users, Ofcom and the Government. To this the Water Industry would be pleased to provide a representative(s) to assist in developing these processes if the RA or Ofcom wish to have an external input.

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8-10-2002