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PCS - 2 GHz  
December 17, 1999

Spectrum Management and Telecommunications Policy

# **Consultation on the Proposed Policy and Licensing Procedures for the Auction of Additional PCS Spectrum in the 2 GHz Frequency Range**

## INDUSTRY CANADA

### RADIOCOMMUNICATION ACT

*Notice No. DGRB-018-99 — Consultation on the Proposed Policy and Licensing Procedures for the Auction of Additional PCS Spectrum in the 2 GHz Frequency Range*

The purpose of this Notice is to invite public comments on the document entitled *Consultation on the Proposed Policy and Licensing Procedures for the Auction of Additional PCS Spectrum in the 2 GHz Frequency Range*.

On November 5, 1999, the Minister of Industry, John Manley, announced that the spectrum cap applying to Personal Communications Services (PCS) will be raised from 40 MHz to a maximum of 55 MHz, and that an additional 40 MHz of additional PCS spectrum will be licensed by the Fall of 2000. The introduction of this new spectrum is necessary to accommodate the growth of mobile wireless services such as cellular and PCS, and to facilitate the implementation of new services.

The document seeks comments on all issues related to the licensing of this additional spectrum. It is available electronically on the Internet at the following address:

World Wide Web (WWW)  
<http://strategis.ic.gc.ca/spectrum>

or can be obtained in hard copy, for a fee, from: Tyrell Press Ltd., 2714 Fenton Road, Gloucester, Ontario K1T 3T7, 1-800-267-4862 (Canada toll-free telephone), 1-800-574-0137 (United States toll-free telephone), (613) 822-0740 (Worldwide telephone), (613) 822-1089 (Facsimile); and Canada Communication Group Inc., 45 Sacré-Coeur Boulevard, Hull, Quebec K1A 0S9, 1-888-562-5561 (Canada toll-free telephone), (819) 779-4335 (Worldwide telephone), (819) 779-2833 (Facsimile).

Interested parties should submit their comments in electronic format (WordPerfect, Microsoft Word, Adobe PDF or ASCII TXT) to facilitate posting on the Department's Web site. Documents submitted should be sent with a note specifying the software, version number and operating system used. All comments should make reference to "Comments - *Canada Gazette* Notice DGRB-018-99".

Comments should be sent to: [pcs.scp@ic.gc.ca](mailto:pcs.scp@ic.gc.ca) no later than February 16, 2000.

Shortly after the close of the comment period, all comments received will be available in hard copy, for a fee, from: ByPress Printing and Copy Centre Inc., 300 Slater Street, Unit 101A, Ottawa, Ontario K1P 6A6, Telephone: 613-234-8826, Fax: 613-234-9464.

Comments received will be posted on Industry Canada's Spectrum Web site: (<http://strategis.ic.gc.ca/spectrum>) by February 21, 2000.

Reply comments on these initial submissions will then be invited.

Again, respondents should provide their comments in electronic format (Word Perfect, Microsoft Word, Adobe PDF or ASCII TXT) to facilitate posting on the Department's Web site. Documents submitted should be sent with a note specifying the software, version number and operating system used. Reply comments submitted should be prefaced by the heading: "Reply comments - *Canada Gazette* Notice DGRB-018-99".

Reply comments should be sent to the Internet address pcs.scp@ic.gc.ca no later than March 8, 2000.

Reply comments will also be made available to the public via Industry Canada's Web site no later than March 13, 2000.

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## 1. Introduction

On November 5, 1999, the Minister of Industry announced<sup>1</sup> that the spectrum aggregation limit applying to personal communications services (PCS) would be raised from 40 MHz to 55 MHz, and that 40 MHz of additional spectrum for PCS would be licensed by auction. These actions were taken to ensure the availability of adequate spectrum resources to meet the needs of the expanding PCS market and also to enable the implementation of new offerings such as third-generation (3G) PCS.

The international community has been actively working through the International Telecommunication Union (ITU) on the development of international standards for 3G PCS (IMT-2000) since 1985. In October 1999, in Helsinki, the ITU was successful in completing the international standards for IMT-2000. IMT-2000 is a third-generation system that provides voice, data and multimedia services at a data rate much higher than that of existing cellular and PCS systems.

In order to facilitate the expansion and enhancement of existing personal communication services, the introduction of 3G PCS and/or the development of other new service offerings, the spectrum in the PCS 'C' and 'E' frequency blocks is being made available for licensing on an exclusive basis. This consultation paper solicits public comment on issues related to the licensing of this additional PCS spectrum.

Following the February 16, 2000 closing date for receipt of comments on this consultation paper, copies of all submissions will be made available to the public through Industry Canada's Web site, as well as through a commercial printing and copying service. Respondents are required to provide their comments in electronic format to facilitate posting on the Department's Web site.

After the close of the first comment period, a reply period will follow, to provide an opportunity for responses to the initial comments. Again, submission in electronic format is required. After the March 8, 2000 closing date of this second period, these reply comments will also be made available to the public.

## 2. Background

In 1983, Rogers Cantel Inc. and Canada's local telephone companies were selected to provide 800 MHz cellular telephony services in Canada. Rogers Cantel Inc. received 25 MHz of spectrum, as did the local telephone companies.

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<sup>1</sup> See the Minister's News Release and *Canada Gazette* Notice No. DGTP-008-99, *Revision to the PCS Spectrum Cap and Timing for Licensing Additional PCS Spectrum* on the Department's Web site (<http://strategis.ic.gc.ca/spectrum>).

In 1995, authorizations to provide personal communications services (PCS) in the 2 GHz band were awarded. Two new entrants, Clearnet PCS Inc. and Microcell Networks Inc. were each granted 30 MHz of spectrum while the major incumbent cellular operators were each granted 10 MHz. One 30 MHz licence (block 'C') and one 10 MHz licence (block 'E') were kept in reserve.

Industry Canada (IC) has required incumbent cellular operators to provide new PCS entrants access to analogue cellular resale and roaming, to facilitate the early availability of national service to PCS subscribers. Furthermore, to promote the expansion of wireless mobile communications to unserved and under-served communities and along highways, the Department established a new party cellular policy in 1998 to give potential new licensees the ability to offer mobile and wireless access services in these areas.

Today, the 800 MHz cellular networks provide coverage to over 93% of the Canadian population. In addition, the capacity of the 800 MHz cellular systems is continuously being enhanced with the introduction of digital technologies. PCS services are now available to a large percentage of the population and in all regions of Canada. Many locations in Canada have access to four competing mobile wireless service providers.

In awarding licences for four of the six available PCS spectrum blocks in 1995, the Minister noted that his actions would promote a strong base from which to enhance competition in the provision of wireless telecommunication services. By reserving the remaining blocks, the Department provided an opportunity to respond to future innovations in a timely fashion. The Minister also stated that he would review the issue of access to the reserved spectrum in three years' time, and in keeping with this basic timetable, the Department is now proceeding to open this spectrum to further promote these objectives.

The Department expects that the demand for this additional PCS spectrum will exceed the available supply, and believes that reliance on the marketplace to select licensees will be in the public interest. Therefore, as announced by the Minister on November 5, 1999, the Department will license this spectrum by auction. The Department proposes that the elements laid out in the document entitled *Framework for Spectrum Auctions in Canada*<sup>2</sup> be generally adopted for this licensing process.

Proposals and questions on the various licence definition and licensing process issues are laid out in the following sections.

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<sup>2</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

### 3. Spectrum Aggregation Limits and Eligibility to Acquire Spectrum

#### 3.1 Spectrum Aggregation Limits

As noted in Radio Systems Policy 021 (RP-021), *Revision to the PCS Spectrum Cap and Timing for Licensing Additional PCS Spectrum*<sup>3</sup>, published November 5, 1999, any PCS licensee is eligible to hold radio licences covering, in any geographical area, frequency assignments aggregating up to a total of 55 MHz of spectrum. This aggregation will consist of:

- (a) spectrum within the PCS band 1850-1990 MHz;
- (b) other spectrum that may be identified for PCS in subsequent proceedings;
- (c) spectrum licensed for cellular mobile radiotelephony services, and for similar public high-mobility radiotelephony services, other than air-to-ground telephony and mobile-satellite services;
- (d) spectrum as defined in (a), (b) and (c) above that is licensed to any affiliate<sup>4</sup> of the entity; and
- (e) spectrum as defined in (a), (b) and (c) above that is licensed to any other entity which has an operating and/or marketing arrangement with the subject entity (or with any of its affiliates), in the same geographical area, for the provision of uniformly-branded or jointly offered telecommunications services.

#### 3.2 Eligibility to Acquire Spectrum

The Department is guided by the following competition principle with regard to the circumstances under which a company's eligibility to acquire spectrum in an area should be restricted.

- A company that currently provides telecommunications services should be restricted from holding certain licences if:
  - (i) that company possesses market power in the supply of one or more telecommunications services in a region covered by the licence to be auctioned;
  - (ii) a new entrant is likely to use the licence to provide services in competition

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<sup>3</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

<sup>4</sup> "Affiliate" means a person who controls the entity, or who is controlled by the entity or by any person who controls the entity. If a person owns, directly or indirectly, at least 20% of an entity's voting shares, where the entity is a body corporate, or where the entity is not a body corporate, at least 20% of the beneficial ownership in such entity, this will result in a rebuttable presumption that the person controls the entity.

with that company's existing services; **and**

- (iii) the anti-competitive effects of that company's acquisition of a licence are not outweighed by the potential economies of scope arising from the integration of the spectrum in question into that company's existing network.

Other than this principle, the Department has made no policy or statement suggesting that an otherwise eligible entity would be precluded from having access to the spectrum to be licensed.

The Department notes that increasing competition in cellular and PCS services has provided the benefits of lower costs and expanded service offerings to Canadian consumers. The Department is also mindful of the large capital outlays that have been committed by the existing cellular and PCS service providers in order to roll out the network infrastructure required to meet consumer demand and Departmental licensing requirements.

Policy measures designed to guarantee the entry of new service providers may further enhance the level of competition in the market-place and promote the positive trends for consumers noted above. On the other hand, splintering of the mobile wireless telecommunications market among a greater number of players could weaken the position of some players in the short term and lead to potentially anti-competitive market consolidation in the longer term. Allowing the possible entry of new parties but not identifying spectrum exclusively for them could represent a balance between these two competing tensions.

For the purpose of discussion in this context, potential applicants for new PCS spectrum could be categorised as:

1. Cellular/PCS licensees currently required by condition of existing licence to provide service in all regions of Canada.
2. Cellular/PCS licensees whose present authority is to provide service within a particular region but who might wish to have additional spectrum within that authorized region, or to expand beyond that region.
3. New entrants not currently licensed for the provision of cellular/PCS service.

The Department seeks comments as to whether and how the public interest would be served by limiting the eligibility of any potential applicants to participate in the auction.



In addition, the Department would be interested in any views as to whether a certain amount of spectrum should be identified for which only new entrants would be eligible to bid. Those supporting such a view should stipulate the amount of spectrum that should be reserved and indicate how such provisions would be in the public interest.

Furthermore, the Department invites comments as to how it should view the potential eligibility of any party that is licensed for the provision of personal communication services under the *Radiocommunication Act* but is not in compliance with its existing licence conditions. Specifically, the Department requests views as to whether such parties (and their affiliates) should be required to be compliant with existing PCS licence conditions before being eligible to acquire additional spectrum.

Finally, the Department solicits input on any other factors that respondents believe are relevant to the eligibility of entities to participate in the auction.

## **4. Definition of Licences**

### **4.1 Spectrum Licences**

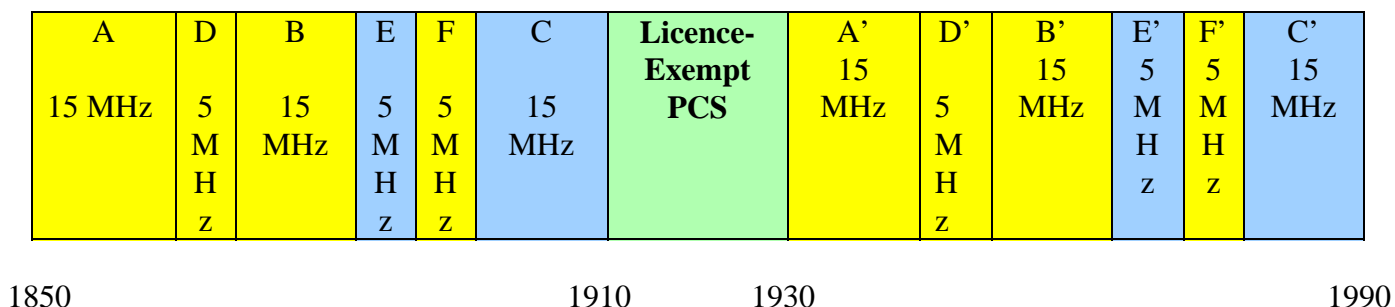
The authorizations available for assignment will be spectrum licences which are defined in subparagraph 5(1)(a)(i.1) of the *Radiocommunication Act* as authorizations "in respect of the utilization of specified radio frequencies within a defined geographic area".

The attributes of these spectrum licences and the conditions that will be attached to them are the subject of the sections that follow. The Department proposes that the elements laid out in the *Framework for Spectrum Auctions in Canada* document be generally adopted for this licensing process.

### **4.2 Spectrum Structure**

The current PCS spectrum structure consists of six symmetrically paired blocks in the frequency range 1850-1990 MHz, as shown in Figure 1. This structure was adopted in 1995 and has been the basis for licensing PCS systems both in Canada and the United States. This structure has also been adopted by some other countries in the Americas. In Canada, blocks A/A', B/B', D/D', and F/F' are currently licensed to PCS operators, leaving the remaining spectrum, a total of 40 MHz in blocks C/C' and E/E', available for licensing. Since 1996, PCS operators in Canada and in many other countries have deployed PCS systems known as second generation (2G), utilizing digital technologies.

**Figure 1**



Frequency block C/C' is 15+15 MHz of paired spectrum in the bands 1895-1910 MHz and 1975-1990 MHz. The lower block is adjacent to spectrum designated for licence-exempt PCS devices. The upper block is adjacent to a mobile satellite downlink band. The E/E' block is 5+5 MHz of paired spectrum situated between the PCS blocks B/B' and F/F', both of which are currently licensed. The frequency bands of the E/E' blocks are 1885-1890 MHz and 1965-1970 MHz.

The current frequency block structure was adopted in Canada in 1995 to meet a number of objectives, including:

1. Ensuring sufficient spectrum to foster competition in voice and data services.
2. Making available different block sizes to allow operators to meet the spectrum aggregation limit requirements.
3. Harmonizing with the U.S. block plan to facilitate roaming and cross-border sharing.
4. Avoiding technological problems that could affect the availability and cost of equipment if a different block plan were used.

From a regulatory standpoint, cellular/PCS operators may use any technology, provided they meet a certain minimum set of technical requirements to ensure interference-free operation. The Department plans to continue this policy for the licensing of the spectrum in PCS blocks 'C' and 'E'.

Canadian cellular/PCS operators currently use a blend of analogue and digital technology to serve subscribers, and multi-mode handsets allow operators to incrementally transition to more spectrally efficient digital technologies. The deployment of second-generation cellular/PCS systems is at various stages of roll-out in Canada. The following table represents the technology map for cellular/PCS services in Canada:

**Table 1 - Access Technologies Used in Cellular/PCS Spectrum**

Cellular 800 MHz	Sub-band A	Mobility Canada members	<ul style="list-style-type: none"> <li>• AMPS (analogue)</li> <li>• CDMA (digital) known as ANSI-95B (based on a 1.25 MHz channel bandwidth)</li> </ul>
	Sub-band B	Cantel	<ul style="list-style-type: none"> <li>• AMPS (analogue)</li> <li>• TDMA (digital) known as ANSI-136 (based on a 30 kHz channel bandwidth)</li> </ul>
PCS 1.9 GHz	A/A'	Microcell	<ul style="list-style-type: none"> <li>• PCS1900 (digital) (GSM technologies at 1.9 GHz) (based on a 200 kHz channel bandwidth)</li> </ul>
	B/B'	Cleartel	<ul style="list-style-type: none"> <li>• CDMA (digital) known as ANSI-95B (based on a 1.25 MHz channel bandwidth)</li> </ul>
	D/D'	Mobility Canada members	<ul style="list-style-type: none"> <li>• CDMA (digital) known as ANSI-95B (based on a 1.25 MHz channel bandwidth)</li> </ul>
	F/F'	Cantel	<ul style="list-style-type: none"> <li>• TDMA (digital) known as ANSI-136 (based on a 30 kHz channel bandwidth)</li> </ul>

In examining the spectrum structure for the 'C' and 'E' blocks, consideration should be given to a number of factors.

### 1. Enabling Future Evolution

A second-generation system is a digital system that provides higher spectrum efficiency for voice communications combined with limited data capability due to the data rate limitation of the access technology. Third-generation systems, known as 3G (IMT-2000), are systems based on ITU IMT-2000 approved standards that provide high data rate capability, therefore allowing a wide range of multimedia services, including Internet applications and video-oriented services. Initial targets for data rates include up to 2 Mbps for in-building/low mobility applications, up to 384 kbps for pedestrian environments, and up to 144 kbps for vehicular environments. Services may include Internet access, multimedia applications, video conferencing, e-commerce transactions, and e-mail.

It is expected that licensees will offer various transitional stages between 2G and 3G services. Furthermore, the Department encourages current, and any future, PCS licensees to adopt business strategies that will enable them to incorporate their existing licensed spectrum into their planning for evolution to 3G services.

## **2. Compatibility Issues Between Different Technologies and Bands of Operation**

Vendors are currently developing new chip sets to address compatibility problems between different access technologies and different bands of operation. It is expected that multi-mode and multi-band handsets will be available in the next few years, thus facilitating roaming and re-sale arrangements. However, while this approach may be attractive in an environment where only 2G technologies are used, the addition of 3G technologies to the possible combination of mode and bands may impact the cost and availability of those handsets.

## **3. Channel Bandwidth Requirements**

Different 2G access technologies require different channel bandwidths (e.g., 1.25 MHz for CDMA, 200 kHz for GSM and 30 kHz for TDMA). The 3G (IMT-2000) standards developed by the ITU will require wider channel bandwidths to accommodate the higher data rate requirements (e.g., multiples of 5 MHz channels).

## **4. Spectrum Efficiency**

In general, the choice of access technology will have an impact on spectrum utilization efficiency for a given spectrum block size. In addition, a small amount of spectrum may also be required as a guard band between systems, either to permit deployment in the same spectrum block or to protect systems using adjacent blocks. The size of the guard band is technology-dependent.

Based on these factors, the Department seeks comments on:

- (i) the minimum size of frequency sub-blocks that would support practical implementation of 2G and initial deployment of 3G (IMT-2000) services, given the frequency block size of the C/C' and E/E' blocks;
- (ii) the preferred sub-block structure of the spectrum in the C/C' and E/E' blocks, taking into account engineering issues, business factors, and the Department's desire to see greater competition and advanced services in all regions of Canada;
- (iii) the implications on roaming and cross-border sharing arrangements of the sub-division of the C/C' and E/E' blocks;

- (iv) the technical challenges that would exist in the context of 2G deployment, initial 3G deployment, and the anticipated evolution from 2G to 3G.

Further factors also need to be considered if a sub-division of the C/C' and E/E' blocks is envisaged, such as the need for paired, symmetrical frequency blocks. As cellular/PCS networks address growing requirements to offer multimedia and internet protocol based (IP-based) services, there may be a need to address asymmetrical traffic flows. The asymmetry in the data flow between the forward and reverse paths may necessitate the establishment of asymmetrical paired blocks for Frequency Division Duplexing (FDD). Therefore, the Department seeks additional comments on:

- the need for operators to have contiguous spectrum blocks in the band 1850-1990 MHz, given the wide range of access technologies available to operators for both 2G and 3G applications;
- the need, if any, to adjust the spectrum block structure to align with asymmetrical traffic flows, taking into account the growing developments in IP-based services over cellular/PCS systems; and
- the need for special provisions to accommodate Time Division Duplexing (TDD) technology in the frequency block structure.

### 4.3 Geography

#### 4.3.1 National Versus Regional Licensing

Since the introduction of cellular services in 1985, the Department has encouraged national mobile coverage of cellular and PCS services through licensing on a national basis, and by requiring that certain roll-out obligations be met by service providers. There has been considerable success in the achievement of this objective.

The cellular operators have now extended their cellular coverage to serve over 93% of the population. In the early phase of implementation, the cellular operators were committed to serve 23 urban centres situated in all regions of Canada. Since the early years of cellular service, the main driver for expansion has been the pressure of competition. The Department has not imposed any additional obligations to increase coverage beyond the roll-out commitments contained in the original conditions of licence. In 1998, the Department issued Radio Systems Policy 019 (RP-019), *Policy for the Provision of Cellular Service by New Parties*<sup>5</sup>, to further stimulate the implementation of cellular services and wireless local loops in under-served and unserved areas of Canada.

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<sup>5</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

In the case of Rogers Cantel Inc., an authorization was granted to serve all regions of Canada. A second national cellular radio infrastructure was facilitated by granting licences to the regional telephone companies operating under the Mobility Canada alliance. While accommodating these companies' initiatives to develop national service, the Department has never imposed any requirement to offer contiguous national service through roaming and marketing arrangements.<sup>6</sup>

The conditions of licence imposed on PCS licensees in 1995 address national coverage as follows:

*"Condition - 1.0 Full National Coverage*

*In order to realize the Government's objective of full coverage, you must implement your system substantially in accordance with the full five year plan contained in your detailed submissions to the Department notwithstanding any stated conditions therein. In addition, you and any entities with which you have submitted an application for 2 GHz PCS, must offer a reasonable level of service in all regions of Canada within two years of the date of this authorization."*

The PCS operators have now extended their PCS coverage to all regions of Canada.

Thus the Canadian public now enjoys two analogue cellular infrastructures which will continue to provide national coverage augmented by third party cellular coverage. These infrastructures are being overlaid with digital technology at 800 MHz and 2 GHz. Furthermore, the Department will continue to enforce the 2 GHz roll-out compliance of the PCS licensees as committed to in their five-year business plans. Continued resale and roaming on analogue cellular services, among all licensees, will also help maintain national service. The resale of PCS service as imposed in the conditions of licence for all PCS operators will assist systems of compatible technology to integrate into national systems.

Mobility Canada announced in May 1999 that it planned to restructure in order to create two competing groups. TELUS Mobility would be the keystone of one group, while the other would be an alliance of the Mobility Canada members from Saskatchewan east. Resale and roaming arrangements have been developed between the two groups to ensure continuation of national service for their customers.

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<sup>6</sup> Regarding recent changes at Mobility Canada allowing competition among members, the Department has chosen not to intervene with measures to preserve national service. At present, the companies involved have developed resale/roaming arrangements to ensure continuation of national service for their customers.

The Department's objective of national coverage has now largely been met, and it is confident that both market forces and the policy measures currently in place will see the continuation of strong national networks. Due to variances across Canada in terms of population levels and densities, demographics, and economic activity, current and potential future licensees may have different needs for meeting the service requirements of various regions across the country.

#### **4.3.2 Geographic Dimension of Licences for Spectrum in Blocks 'C' and 'E'**

Auctioning national frequency blocks might be advantageous to potential new entrants seeking to compete against established national players. Assigning new spectrum in national frequency blocks might also contribute to the national coverage objective discussed in the previous section.

On the other hand, auctioning new spectrum as national blocks may not be in the best interest of those who wish to serve regional niche markets, or of those needing regional spectrum to complete their networks or to address spectrum shortages which inhibit increases in the capacity of networks in particular areas.

Within the context of the eligibility issues discussed in section 3.2, the Department seeks comment as to whether national spectrum blocks, regional spectrum blocks, or a combination of both would be appropriate.

Given the likelihood that mobile services will be offered with this new spectrum, reasonably large service areas would appear warranted. Therefore, should regional spectrum blocks be offered, the Department proposes that Tier 2 service areas, as defined in the document entitled *Service Areas for Competitive Licensing*<sup>7</sup>, be used. (See Table 2 in section 8.1 for more data on Tier 2 service areas.)

With reference to section 3.2 above, the Department also seeks comment on the following issues:

- If regional PCS licensees previously under the former Mobility Canada consortium were eligible to bid for additional spectrum to expand their coverage beyond their present serving areas, would it be desirable as a public policy to require them to serve all regions of Canada? If such a policy were desirable, how might this objective be achieved?

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<sup>7</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

- If spectrum were identified specifically for new entrants, would it be desirable that they be required to serve all regions of Canada? If such a policy were desirable, how might this objective be achieved?
- If new entrants were eligible to participate in the auction but with no spectrum specifically identified for them, would it be desirable that they be required to serve all regions of Canada? If such a policy were desirable, how might this objective be achieved?

#### 4.4 Displacement of Microwave Incumbents

The spectrum in the band 1850-1990 MHz was designated for the implementation of PCS service under the 1995 policy, *Wireless Personal Communications Services in the 2 GHz Range*<sup>8</sup>. In that document, provisions were made to gradually displace the fixed microwave systems using this spectrum. A transition policy was adopted with specific rules for the release of spectrum for PCS systems and the orderly displacement of fixed microwave installations.

In October 1994, the Department revised the *Canadian Table of Frequency Allocations*<sup>9</sup> and established that priority be given to mobile service in the band 1850-1990 MHz as of July 1, 1997. The Department also established that fixed stations would need to be displaced where necessary to accommodate mobile service based on a spectrum utilization policy (see footnote C35 of the *Canadian Table of Frequency Allocations*). In November 1994, Industry Canada placed a moratorium on the licensing of new fixed microwave systems in this band.

In the transition provisions of the 1995 PCS policy, the Department established, among other things, that:

*"For any fixed frequency assignment subject to displacement, the notification period will be a minimum of 4 years for microwave equipment that has been licensed for 10 years or less at the time of the notification, with the exception of frequency assignments authorized to PCS licensees and their affiliates, and the cellular carriers, in which case a minimum notification period of 2 years will apply. Frequency assignments for which the microwave equipment has been licensed for more than 10 years at the time of notification will be given a minimum notification period of 2 years. Earlier displacement may be achieved through mutual agreements between PCS operator(s) and the affected fixed station operator(s)."*

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<sup>8</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

<sup>9</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).



These provisions for the displacement of fixed microwave systems have worked well in the early introduction of PCS service. A large number of fixed frequency assignments in large urban areas and some major highways have been displaced since the transition policy was announced. However, as the Department prepares for the licensing of additional PCS spectrum, it is appropriate to review the time-lines established in the 1995 transition policy for the displacement of fixed frequency assignments.

The case could be made to reduce the notification period for all fixed frequency assignments in this spectrum to provide PCS operators greater flexibility to expand their services, considering that a moratorium on further licensing of fixed systems was established some five years ago (since October 1994), that the secondary status of fixed service became effective on July 1, 1997 (footnote C35), and that microwave equipment in operation is over ten years old. On the other hand, there are a number of microwave systems operating in rural and remote areas where the PCS spectrum may not be needed for a number of years, where there is the possibility of PCS operation that will not be affected by fixed systems, or where fixed microwave operators may elect to operate on a secondary basis and accept potential interference from PCS systems.

The Department is of the view that in certain situations, the notification period for the displacement of fixed assignment may delay the expansion of PCS service. In a recent transition policy<sup>10</sup> to open spectrum at 2 GHz for the mobile satellite service, the Department established January 1, 2003 as the earliest date for microwave displacement with a two-year notification period. In the next two to four years, wireless PCS capability promises to evolve as a significant high-speed data access component with a rich level of services based on the Internet, including e-commerce. An argument could be made that PCS service providers should not be disadvantaged, compared to wireline carriers, by having to wait for a long period to gain access to the spectrum.

Industry Canada seeks comments on accelerating the existing transition provisions for all licensed PCS spectrum (1850-1910/1930-1990 MHz) so that Canadians, wherever they live, can benefit from new PCS services over a relatively short implementation period. The Department proposes the following:

- As of January 1, 2001, **all** fixed frequency assignments subject to displacement will be afforded a minimum of a **two-year notification period**.
- Fixed microwave operators will have to file with the Department by January 1, 2001 their plans to migrate their fixed service operations to other frequency bands (in particular for high market areas and in the vicinity of major highways), and be

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<sup>10</sup> *Amendments to the Microwave Spectrum Utilization Policies in the 1-3 GHz Frequency Range (SP 1-3 GHz)*, available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

able to accommodate a transition over a one-year notification period.

- As of January 1, 2002, **all** fixed frequency assignments will be afforded a minimum of a **one-year notification period**.
- Starting on January 1, 2002, the Department may establish geographic areas and serve notification that all fixed frequency assignments in these areas must cease operation within one year.

In April 1997, the Department issued Spectrum Utilization Policy 1910 MHz (SP 1910 MHz), entitled *Licence Exempt Personal Communications Services in the Frequency Band 1910-1930 MHz*)<sup>11</sup>. The provisions of the transition policy are summarized as follows:

- a minimum notification period of two years for the displacement of a fixed station frequency assignment to accommodate non-nomadic PCS devices;
- a minimum notification period of three years for the displacement of fixed station frequency assignments across the country to accommodate nomadic PCS devices.

The Department also seeks comment on whether it would be appropriate, and to what extent, that similar accelerated provisions apply to the licence-exempt PCS spectrum in the sub-band 1910-1930 MHz.

#### 4.5 Licence Tenure

The Department proposes that licences have a ten-year term and a high expectation of renewal at the end of the term. That is to say, the Department intends to generally renew licences for subsequent ten-year terms unless a breach of licence condition occurs, a fundamental reallocation of spectrum to a new service is required (e.g., a change in the international allocation), or an overriding policy need arises (e.g., a spectrum reallocation to address a national security issue). To provide a more stable investment climate for licensees, a consultation process will commence no later than two years prior to the end of the licence term if the Department foresees the possibility that a licence will not be renewed. The imposition of any renewal fees in the subsequent term will also be addressed in a consultation process which will commence no later than two years prior to the end of the licence term.

In the event of bankruptcy or insolvency of a licence holder, the status and treatment of the licence will be subject to the general laws of bankruptcy and insolvency.

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<sup>11</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

#### 4.6 Transferability and Divisibility

The Department proposes that auctioned licences will be transferable and divisible (i.e., transferable in part in the spectral and/or bandwidth dimensions) subject to the following conditions and guidelines:

- All eligibility criteria and other conditions that apply to a licence, including those related to interference management, will continue, as applicable, should the licence be transferred.
- Should an auction winner transfer its licence to another party, for example, four years into a ten-year licence term, the second party will only receive a licence term equal to the remaining six years, but will be eligible for the same licence renewal provisions as the original licensee.
- All proposed licence transfers must comply with any spectrum aggregation limits or other measures intended to preclude anti-competitive behaviour that may be in place. (It should be noted that any licence transfer may also be subject to the provisions of the *Competition Act*.)
- In order to maintain compatibility with the Department's database, licences will be divisible in the geographic dimension only in terms of Spectrum Grid cells<sup>12</sup>. Thus, when an auctioned licence is divided, the minimum geographic size that any one of the new divisions may take is one Spectrum Grid cell. The individual Spectrum Grid cells are sufficiently small that even with this restriction, an extremely high degree of flexibility will be available to the parties involved in determining the size and shape of sub-divided portions of a licence.
- There will be no minimum limit to divisibility in the bandwidth dimension.
- Written notification will be required of all proposed licence transfers. The Department will also request attestations or other documentation to ensure that the points above (e.g., compliance with the eligibility criteria and other conditions of licence) have been satisfactorily addressed. Once a licence transfer has been registered, the Department will revoke the original licence and issue a new licence(s) in its place.

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<sup>12</sup> Spectrum Grid cells are defined in the Industry Canada (Spectrum Management) Client Procedures Circular 2-1-16 (CPC-2-1-16), *Licensing Procedure for Local Multipoint Communications Systems (LMCS)*, (February 1, 1997), available on the Strategis Web site at <http://strategis.ic.gc.ca/spectrum>. Spectrum Grid cells are six-sided figures with an area of 25 km<sup>2</sup> that fit together in an interlocking pattern over the geography of Canada.

- The Department will maintain a publicly accessible database listing all auctioned licences and the respective licensee, and will update the database upon a licence transfer.

It should be noted that the licences of incumbent cellular and PCS operators are not subject to this more liberalized transferability regime at this time. The transfer of an existing radio licence to another party continues to be subject to a full review of the application by the Department and the approval of the Minister. The Department would be favourably disposed, however, to requests for any post-auction spectrum transfers needed to rationalize the holdings of all PCS licensees.

## 5. Technical Considerations

When the Department authorized four PCS operators in 1995, it took a technology-neutral approach, allowing the service providers to choose from the various access technologies available. However, while not mandating the choice of technology, the Department did establish minimum technical requirements for the efficient use of the band 1850-1910 MHz/1930-1990 MHz for personal communications services. Those minimum technical requirements are described in two documents: Standard Radio System Plan 510 (SRSP-510), *Technical Requirements for Personal Communications Services in the Bands 1850-1910 MHz and 1930-1990 MHz*, and Radio Standards Specification 133 (RSS-133), *2 GHz Personal Communications Services*<sup>13</sup>.

The basic principle was to establish technical requirements to permit the co-existence of systems operating in adjacent blocks in a technology-neutral environment. The deployment of the PCS services was therefore based on SRSP-510 and RSS-133 which set the technical prescriptions permitting such co-existence.

Unless compelling circumstances dictate otherwise, the Department intends to apply those technical requirements to the usage of blocks 'C' and 'E', or any sub-divided blocks if appropriate, to ensure the protection of existing PCS systems.

## 6. Conditions of Licence

The conditions of licence will be clearly stipulated prior to the auction. It should be noted that there are differences between the conditions of licence for current cellular and PCS licensees, and the conditions of licence proposed below for the spectrum in the 'C' and 'E' blocks.

The Department proposes and seeks comment on the following conditions of licence.

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<sup>13</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

## 6.1 Licence Conditions for the Spectrum in the 'C' and 'E' Blocks for All Licensees

### 1. Licence Term

The term of this licence will be ten years from the date of licence issuance. At the end of this term and any subsequent terms, the licensee will have a high expectation of renewal for a further ten-year term unless a breach of licence condition has occurred, a fundamental reallocation of spectrum to a new service is required or an overriding policy need arises.

A public consultation process regarding the renewal of the licence will commence no later than two years prior to the end of the licence term if the Department foresees the possibility that it will not renew this licence or if renewal fees are contemplated.

It should be noted that the licence is subject to relevant provisions in the *Radiocommunication Act* and the *Radiocommunication Regulations*. For example, the Minister continues to have the power to amend the terms and conditions of the spectrum licence (paragraph 5(1)(b) of the *Radiocommunication Act*). Such powers would be exercised on an exceptional basis, and only after full consultation.

### 2. Licence Transferability and Divisibility

The licensee may transfer its licence(s) in whole or in part (divisibility), in both the bandwidth and geographic dimensions. The area transferred in the geographic dimension may be no smaller than a single Spectrum Grid cell.<sup>14</sup> No minimum limit will be imposed on the amount of spectrum transferred in the bandwidth dimension.

For each proposed transfer of this licence, the licensee must provide a written notification to the Department. The transferee(s) must also provide an attestation (or other appropriate documentation) that it meets the eligibility criteria and all other conditions of this licence.

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<sup>14</sup> Spectrum grid cells are defined in the Industry Canada (Spectrum Management) Client Procedures Circular 2-1-16 (CPC-2-1-16), *Licensing Procedure for Local Multipoint Communications Systems (LMCS)*, February 1, 1997 (available on the Strategis Web site at <http://strategis.ic.gc.ca/spectrum>), as amended from time to time.

### 3. Spectrum Aggregation Limit

The licensee must comply with the spectrum aggregation limits outlined in Radio Systems Policy 021 (RP-021), *Revision to the PCS Spectrum Cap and Timing for Licensing Additional PCS Spectrum*<sup>15</sup>, published November 5, 1999. The spectrum aggregation limit within a service area consists of spectrum licensed to the licensee and to its affiliates. The licensee must notify the Minister of any change which would have a material effect on its compliance with these spectrum aggregation limits. Such notification must be made in advance for any proposed transactions within its knowledge.

### 4. Eligibility Criteria

If the licensee is acting as a radiocommunication user or is providing service as a radiocommunication service provider other than a radiocommunication carrier, the licensee must comply on an ongoing basis with the eligibility criteria in section 9(1) of the *Radiocommunication Regulations*. The licensee must notify the Minister of any change which would have a material effect on its eligibility. Such notification must be made in advance for any proposed transactions within its knowledge.

If the licensee is providing service as a radiocommunication carrier, the licensee must comply on an ongoing basis with the Canadian ownership and control requirements in section 10(2) of the *Radiocommunication Regulations*<sup>16</sup>. The licensee must notify the Minister of any change which would have a material effect on its Canadian ownership and control. Such notification must be made in advance for any proposed transactions within its knowledge.

### 5. Displacement of Microwave Incumbents

The licensee must comply with the transition policy and relocation procedure for the relocation of incumbent microwave stations outlined in Client Procedures Circular 2-1-09 (CPC-2-1-09), *Displacement of Fixed Service Stations Operating in the 2 GHz Frequency Range to Accommodate Licensed Personal Communications Services (PCS)*<sup>17</sup>.

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<sup>15</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

<sup>16</sup> See Industry Canada (April 1, 1999), Client Procedures Circular 2-0-15 (CPC-2-0-15), *Canadian Ownership and Control* (available on the Strategis Web site at <http://strategis.ic.gc.ca/spectrum>), as amended from time to time.

<sup>17</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

## 6. Radio Station Installations<sup>18</sup>

Site specific radio licences will not be required for each radio station. However, for each radio station, the licensee must ensure that:

- radio stations are installed and operated in a manner that complies with Health Canada's limits of exposure to radiofrequency fields;
- where applicable, antenna structures are marked in accordance with the recommendations of Transport Canada; and
- prior to installation of significant antenna structures, consultation with the appropriate land use authorities has taken place.

## 7. Provision of Technical Information

When the Department requests technical information on a particular station, or on a network, it must be provided by the licensee to the Department according to the definitions and criteria specified by the Department.

## 8. Laws, Regulations, and Other Obligations

The licensee is subject to, and must comply with, the *Radiocommunication Act*, the *Radiocommunication Regulations* and the International Telecommunications Union *Radio Regulations* pertaining to its licensed radio frequency bands.

The licence is issued on condition that the certifications made in the application materials are all true and complete in every respect.

## 9. Technical Considerations

The licensee must comply with the technical requirements set forth in SRSP-510, and deploy equipment certified under RSS-133<sup>19</sup>. SRSP-510 provides information on channelling plans, out-of-block emission limits, permissible EIRPs (effective isotropic radiated power) and antenna heights. RSS-133 provides standards for the certification of transmitters and receivers for personal

communications services (PCS) in the 2 GHz band. (Note that the technical

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<sup>18</sup> Industry Canada (June 24, 1995), Client Procedures Circular 2-0-03 (CPC-2-0-03), *Environmental Process, Radiofrequency Fields and Land-Use Consultation* (available on the Strategis Web site at <http://strategis.ic.gc.ca/spectrum>), as amended from time to time.

<sup>19</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

standards may be revised after this consultation process, in order to align with the policy and licensing decisions related to the use of the 'C' and 'E' blocks.)

## 10. International Coordination

The licensee must comply with the requirements of cross-border sharing and coordination arrangements established between Canada and the United States, as amended from time to time. While frequency assignments are not subject to site-by-site licensing, licensees may be required to furnish all necessary technical data to Industry Canada for each relevant site in order for international coordination to be effected with the United States as per the terms of any existing or future sharing arrangement. Should international coordination be required, Industry Canada will identify the appropriate data elements, format and means of submission.

## 6.2 Licence Conditions for the Spectrum in the 'C' and 'E' Blocks for Radiocommunication Carriers

### 11. Lawful Intercept

Licensees who will use the spectrum for circuit-switched voice telephony systems must, from the inception of service, provide for and maintain lawful interception capabilities as authorized by law:

- (a) The requirements for lawful interception capabilities are provided in the *Solicitor General's Enforcement Standards for Lawful Interception of Telecommunications* (Rev. Nov. 95). These standards may be amended from time to time, following consultation with the Solicitor General of Canada and the licensees.
- (b) Licensees may request the Minister to forbear from enforcing certain assistance capability requirements for a limited period. The Minister, following consultation with the Solicitor General of Canada, may exercise his power to forbear from enforcing a requirement or requirements where, in the opinion of the Minister, the requirement(s) is (are) not reasonably achievable. Forbearance requests must include specific details and dates when compliance to requirement(s) can be expected.

### 12. Research and Development

When a licence is issued to a radiocommunication carrier, the licensee must invest, as a minimum, two percent of its adjusted gross revenues resulting from its operations in this spectrum, over the term of the licence, in eligible research and development activities related to telecommunications. Eligible research and development activities are those which meet the definition of scientific research



and experimental development adopted in the *Income Tax Act*. Adjusted gross revenues are defined as total service revenues less inter-carrier payments, bad debts, third-party commissions, and provincial and goods and services taxes collected.

If the licence is transferred to any eligible entity by a radiocommunication carrier prior to the expiration of its term, the condition of licence relating to investment in research and development will continue to apply on the initial transfer of the licence and on any subsequent transfer until the term of this licence expires. Prior to a transfer, in whole or in part, of this licence, the proposed transferee must undertake to ensure that the sum of the investment it will make in eligible research and development activities and all investments made by prior licensees in eligible research and development<sup>20</sup> activities equals, as a minimum, two percent of the aggregated adjusted gross revenues resulting from all operations in this spectrum, over the term of the licence. An attestation signed by the proposed transferee setting out the undertaking must accompany the licence transfer notification to be submitted to the Department by the licensee prior to the transfer being effected.

To facilitate compliance with this condition of licence, the licensee should consult the Department's *Guidelines for Compliance with the Radio Authorization Condition of Licence Relating to Research and Development*.<sup>21</sup> Further details on the exact administrative procedures for transferring a spectrum licence will be provided in a forthcoming Client Procedures Circular.<sup>22</sup>

### 13. Annual Reporting

When a licence is issued to a radiocommunication carrier, the licensee must submit an annual report for each year of the term of the licence indicating continued compliance with all licence conditions, including:

- audited Financial Statements as required under the licensee's jurisdiction of incorporation, including an audited Statement of Research and Development Expenditures with an accompanying Auditor's Report, prepared in accordance with the same standards of reporting; to facilitate compliance with this reporting requirement, the licensee should consult the *Guidelines for Compliance with the Radio Authorization Condition of Licence Relating to*

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<sup>20</sup> As reported in the prior licensees' audited Statements of Research and Development Expenditures which would have been submitted annually to the Department.

<sup>21</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

<sup>22</sup> This document will be made available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

*Research and Development* published by Industry Canada<sup>23</sup>; and

- a copy of any existing corporate annual report for the licensee's fiscal year with respect to the authorization.

The reports are to be submitted, in writing, within 120 days of the licensee's fiscal year end, to the:

Manager, Wireless Networks  
Radiocommunications and Broadcasting Regulatory Branch  
300 Slater Street, 15th Floor  
Ottawa, Ontario  
K1A 0C8

Confidential information provided will be treated in accordance with section 20(1) of the *Access to Information Act*.

## **7. Licensing Process and Auction Design**

The Department seeks comments on the licensing process and auction design proposed below.

### **7.1 Comment Period**

After the February 16, 2000 closing date for receipt of comments to this consultation paper, copies of all the comments received will be made available to the public through Industry Canada's Web site, Industry Canada libraries, and a commercial printing and copying service. Respondents are required to provide their comments in electronic format to facilitate posting on the Department's Web site.

### **7.2 Reply Comments**

A reply comment period will be opened once the comments have been posted on the Department's Web site. The initial comments will be published by Monday, February 21, 2000. During this second period, respondents may comment on the initial comments of others. Again, the submission of reply comments in electronic format is required. After the March 8, 2000 closing date of this second period, these reply comments will also be made available to the public.

### **7.3 Final Policy Paper**

After having reviewed all the input received, the Minister of Industry will make final

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<sup>23</sup> Available on the Department's Strategis Web site (<http://strategis.ic.gc.ca/spectrum>).

policy decisions. A Notice will be published in the *Canada Gazette* announcing the availability of the final policy paper. The following elements will be described:

- the licences to be auctioned;
- the terms and conditions attached to the licences;
- the opening bid for each licence;
- the rules of the auction; and
- the eligibility criteria and application procedures to participate in the auction.

#### **7.4 Submissions**

The Department notes the limited participation in the voluntary "Notification of Interest" process before the auction of the 24 and 38 GHz bands, and therefore proposes to eliminate this step for the forthcoming PCS auction.

Prospective bidders will be invited to submit the following:

- written questions asking for clarification of rules or policies; and
- their auction application<sup>24</sup> (including a financial deposit).

It should be noted that no confidential questions will be accepted. All questions submitted and the Department's answers to them will be made public. The various deadlines for receipt of the written questions and the auction application materials (including the financial deposit), and the address to which they should be sent, will be specified in the final policy paper. The Department's responses to the questions received will be made public shortly after the deadline for receipt.

#### **7.5 Review of Applications**

Once the deadline for receipt of applications to participate in the auction has passed, all applications received will be reviewed to assess whether or not all criteria have been satisfied. An opportunity will be provided for applicants to make clerical corrections and other necessary amendments to the application materials and irrevocable standby letters of credit they have submitted. Those having acceptable applications will then receive bidder packages (which will include items such as the instructions required to use the Department's automated bidding system and the initial bidding schedule). A listing of which applicants have and have not been qualified as bidders will be made public.

#### **7.6 Mock Auction**

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<sup>24</sup> It should be noted that prospective bidders may be required to make full disclosure of any communications, agreements, arrangements or affiliations which they have entered into with any other potential bidder regarding the auction in question.

A mock auction will be held for the qualified bidders to allow them to better familiarize themselves with the bidding system and software.

## **7.7 Auction Design**

The Department proposes the use of a simultaneous multiple-round auction. The auction will be run electronically, and bidders will be able to participate remotely from their office.

The rules for the simultaneous multiple-round auction call for a related set of licences to be offered for sale at the same time. Bidding is organized into a series of rounds. At the beginning of each round, bidders are provided with information that includes the standing high bids on each licence and information about the bidder's own eligibility for bidding. New bids for a licence are required to exceed the standing high bid by at least some pre-established increment. In each round, bidders are offered an opportunity to withdraw bids made in previous rounds, subject to a penalty. A minimum pace of bidding in the auction is established by the "activity rule", which penalizes bidders who are inactive by reducing their "bidder eligibility points". The rounds continue until there are no new bids on any licence. All these details of the auction format are discussed more fully below.

The Department notes the recent successful completion of the auction of the 24 and 38 GHz bands using the design discussed below. At the same time, the Department is working on improvements to its auction system based on new developments around the world in theoretical and applied auction design. The Department would not wish to unduly delay the forthcoming PCS auction and thus would be prepared to use the existing auction design and software system that performed well in the auction of the 24 and 38 GHz bands. However, should an improved system be operational in sufficient time, the Department would of course prefer to use it. The potential differences that could be incorporated in the new design are identified in the sections below.

### **7.7.1 Bidder Eligibility Points**

Each licence will be assigned a number of points approximately proportionate to the bandwidth and population covered by that licence. As part of the application package to participate in the auction, each prospective bidder will be asked to indicate the total number of "points-worth" of licences that it may wish to bid on in any round.<sup>25</sup> This number, which will also determine the

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<sup>25</sup> For example, suppose that a bidder wished to be able to bid on licence X (two points), licence Y (three points), and licence Z (five points). This bidder could ask to have up to ten points-worth of initial eligibility. If the bidder knew that it would not wish to be actively bidding on all three licences at the same time, it might choose to have a lower level of initial eligibility, for example eight points, and thus be required to submit a smaller pre-auction financial deposit.

pre-auction deposit required from the bidder (i.e., the required deposit will be calculated on a dollar per point basis - see section 8.2), will define that bidder's initial level of "bidder eligibility points". The purpose of this information is to assist in the development of activity rules (discussed in more detail below) which are used to hasten the speed of the auction.

### **7.7.2 Activity Rule**

Before the auction, each bidder will have to specify the total number of "points-worth" of licences that it may wish to bid on in any round (as per the discussion on bidder eligibility points above). A bidder is defined to be active on a particular licence in a given round if either it has the standing high bid from the previous round<sup>26</sup> or if it submits an acceptable bid in that current round. There will be three stages, each containing an unspecified number of bidding rounds.

In the first stage, bidders must be active on licences whose corresponding points add up to a certain percentage of the bidder's eligibility level (the Department proposes something in the range of 50% to 80%). In the second stage, the percentage is increased (to, say, 80% to 90%). In the final stage, bidders must be active on 100% of their eligibility levels. If a bidder falls short of the required activity level, the bidder's eligibility point level shrinks proportionately. The auction will begin and continue in stage one until bidding activity declines significantly (for example, three consecutive rounds in which new bids are placed on ten percent or less of the licences available). At this point, the auction will move to stage two - and similarly to stage three later in the auction.

### **7.7.3 Bid Withdrawals and Related Penalties**

In the event a bidder makes a bid which it later wants to change, that bidder will be given the opportunity to withdraw it. To encourage meaningful bids, however, a bid withdrawal penalty will be imposed. This penalty will correspond to the potential loss in revenue caused by the withdrawn bid. If the licence for which the bid has been withdrawn ends up selling for more than the withdrawn bid, then no penalty will be charged to the bidder. If the licence ultimately sells for less than the withdrawn bid, then the penalty will be the difference between the withdrawn bid and the eventual final selling price. As a measure to reduce the overall time of the auction, while not compromising the auction's efficiency, the Department will allow bidders to place new bids and/or withdraw previously submitted bids at the same time during a round, as opposed to having two distinct phases - one for bid submission and one for bid withdrawal - during each round.

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<sup>26</sup> And has not withdrawn that standing high bid.

To deter possible misuse of bid withdrawals, the Department may impose an additional penalty on any bidder who withdraws high bids in more than a specified number of rounds. For example, an additional penalty of 2% of the withdrawn bid amount (or \$10,000, whichever was greater) may be assessed for each standing high bid withdrawn after a bidder has withdrawn bids in more than five different rounds of the auction. Alternatively, the Department may impose a limit on the number of rounds in which any bidder may withdraw standing high bids and/or institute other measures to prevent a bidder from repeatedly withdrawing and bidding on the same licence.

#### **7.7.4 Bid Increments**

Bid increments, like activity rules, are necessary to help hasten the auction's progress. For a bid to be acceptable, it must be larger than the current standing high bid by the bid increment. Increments will be set in percentage terms (X percent of the standing high bid) and/or in absolute dollar amounts (\$Y per point). Bid increments will be changed during the course of the auction. For example, at the beginning of an auction when bidding activity is likely to be high, bid increments will be relatively large (for example, 10% to 15%). As the pace of the bidding falls below a certain threshold, bid increments will be reduced (perhaps down to 1% by stage three). The rules for changing bid increments will be laid out with a fairly high degree of precision prior to the auction; however, to ensure the auction closes in a reasonable amount of time, there will be flexibility to "override" the rules regarding bid increments. Bidders will be given prior notice of any proposed changes to the size of the bid increments.

The Department is also considering the use of a mechanism which would set the bid increment for each licence in relation to recent levels of bidding activity for that licence. For example, the bid increment formula might establish an increment of 20% for a licence that had received bids from several bidders during recent rounds, while the increment for a licence that had received no bids for many rounds might be set at only 5%.

### **7.7.5 Waivers**

Waivers are designed to prevent a bidder from losing eligibility when it does not satisfy the activity requirements in a given bidding stage. The purpose of waivers is to protect bidders against possible mistakes they might make during the course of the auction or to allow them to maintain eligibility in the case of technical or communication problems. Each bidder will be given five waivers at the beginning of the auction. Additional waivers may be given should the pace of the auction go beyond five rounds per day.

As was the case in the auction of the 24 and 38 GHz bands, the Department also proposes to allow any bidder with waivers remaining to keep the auction open (see discussion on the stopping rule in the next section) by submitting a "pro-active" waiver after a round with no new bids on any licences.

### **7.7.6 Stopping Rule**

The auction will close when a round goes by in the third stage without any acceptable bids on any licences having been submitted. In exceptional circumstances, and after all participants have been notified in advance, any round can be declared as the final round. Similarly, exceptional circumstances such as a natural disaster, for example, may result in the auction being delayed, suspended or cancelled.

### **7.7.7 Discretionary Versus Non-discretionary Bidding**

The recently completed auction of the 24 and 38 GHz bands used a mechanism known as non-discretionary bidding. What this means is that rather than being offered the opportunity to enter any amount that exceeds the standing high bid by at least some minimum bid increment, bidders would instead have the choice of giving either a "Yes" or "No" response as to whether they wish to bid an exact amount equal to the standing high bid plus a predetermined bid increment. Non-discretionary bidding has a number of potential advantages, as outlined below.

- It drastically simplifies submission of bids, eliminating the errors that sometimes occur when a bidder must fill dozens (or even hundreds) of boxes with numbers that could potentially be large.
- It allows rounds to be more brief and more frequent, both because the mechanics of entering and checking bids are simpler, and because the prices,

which never jump<sup>27</sup> in the revised design, are more predictable. This also reduces the need for frequent executive oversight during the bidding, saving costs for the bidders.

- It removes opportunities for bidders to send potentially collusive messages through the trailing digits of their bid amounts. (This problem can be alleviated in a discretionary bidding mode by rounding and/or truncating bid amounts.)

On the other hand, non-discretionary bidding can delay the closing of the auction when the final rounds are characterized by back-and-forth bidding by a small number of bidders on a small number of licences.

There have also been concerns expressed from time to time about the time-stamp tie-breaking rule<sup>28</sup> which obviously is applied much more frequently with non-discretionary bidding. Some parties have suggested that the time-stamp tie-breaking rule might favour those bidders who, for example, have the fastest computers.<sup>29</sup> The results of the 24 and 38 GHz auction, however, would appear to show that the time-stamp tie-breaking rule had virtually no impact in determining the winners of the licences that were ultimately assigned.

The Department seeks comment as to whether discretionary or non-discretionary bidding would be preferable.

The Department also continues to investigate the possible use of "multiple increment bidding". This format is a variation on the non-discretionary bidding methodology described above. It allows bidders to increase high bids by a multiple of the established bid increment. If, for example, the standing high bid on a licence was \$1,000,000 and the bid increment was 10% (which equals \$100,000), bidders would have the option of bidding between one and,

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<sup>27</sup> Since bid levels would increase each round by only the established increment, bidders will be able to exactly forecast the maximum possible values that the price for any particular licence could reach by the end of the currently announced schedule. The bid schedule will be updated regularly so that bidders will always be able to make rolling forecasts for, for example, one or two weeks in advance.

<sup>28</sup> Under the non-discretionary bidding scenario, all bids on the same licence in a given round would, of course, be tie bids. It was proposed that the first bidder (all bids would be electronically time-stamped as they were received) to place a bid on a licence be given the status of standing high bidder on that licence for the next round. Other administrations have used the same tie-breaking rule with discretionary bidding, but the incidence of tie bids under that scenario has tended to be quite low.

<sup>29</sup> It is worth noting, however, that unless the difference between two bidders' valuations for a licence is so small as to fall within the margin of a single bid increment, the relative speed of bidders' computers or telecommunications links will not be a factor in the eventual outcome. As bid levels rise, the bidder with the lower valuation will drop out, allowing the bidder with the higher valuation to win at a price just above the lower bidder's drop-out point.



say, nine increments - thus, the bid amount could rise by up to \$900,000. A new automated bidding system which allowed multiple increment bidding could also feature random selection of the standing high bidder in cases of tie bids, as opposed to the time-stamp mechanism in the current software.

The multiple increment bidding format would appear to preserve the previously mentioned benefits of non-discretionary bidding while at the same time reducing the incidence of tie bids and any possible related problems. Multiple increment bidding would also lead to the faster conclusion of an auction than would single-increment non-discretionary bidding.

#### **7.7.8 Bidder Identities**

The Department proposes that the identities of all bidders, the licences on which they are qualified to bid, and their initial eligibility levels be made public prior to the commencement of bidding. As well, the Department proposes that full information on the bids placed by all bidders be made available after each round.

#### **7.7.9 Enforcement of Spectrum Aggregation Limits**

The spectrum aggregation limit is laid out in section 3.1 of this document.

During the auction of the 24 and 38 GHz bands, bidders were permitted to place bids and hold standing high bids on licences within a service area that would exceed the spectrum aggregation limit. This was allowed in order to provide bidders more flexibility should they wish to shift the focus of their bidding from, for example, 'A' block licences to 'B' block licences. The rules of the 24 and 38 GHz auction did state that "Any bidder who at the auction's close is the standing high bidder on licences such that it will exceed the aggregation limit in any service area must forfeit bids on sufficient licences to bring itself into alignment with the aggregation limit before any licences will be issued to it."

The Department seeks input as to whether this flexibility should be allowed, or whether the benefits of this flexibility are outweighed by the potential problem of one bidder exceeding the aggregation limit and forfeiting on licences after the auction, solely to preclude a competitor from acquiring spectrum in an area in a timely manner.

## **7.8 Auction**

The auction will commence and proceed until it ends according to the specified stopping rule. High bidders at the auction's close will be issued their licences provided their bid amounts are paid in full, and provided they are compliant with all applicable criteria and conditions by the deadlines specified in the final policy paper. Should any licences remain unassigned after the auction, the Department's preferred approach will be to offer them in a subsequent re-auction within a reasonable period of time.

## **7.9 Post-Auction Procedures**

### **7.9.1 Bids and Withdrawal Penalties**

After the auction's close, the sum of the standing high bids and the sum of any withdrawal penalties incurred will be calculated for all bidders. If the value of any withdrawal penalties cannot be calculated at that time because one or more licences remain unsold at the auction's close, the full value of the withdrawn bid will be used as an interim proxy for the value of the withdrawal penalty.<sup>30</sup> Bidders will be required to pay 20 percent of their standing high bids and 100 percent of their withdrawal penalties within ten business days of the auction's close. The remaining 80 percent of the standing high bids will be required within 30 business days of the auction's close.

### **7.9.2 Bid Forfeiture and Related Penalties**

After the conclusion of the auction, any bidder who has submitted the high bid on a licence but fails to comply with the specified payment schedule or with the applicable conditions and criteria for licensing will forfeit its right to have the licence issued to it. Furthermore, the bidder will be required to pay a penalty in the amount of the difference between the forfeited bid and the eventual selling price of the licence (in a subsequent re-auction), if the re-auction price is lower than the forfeited bid. An additional amount of 3% of the original forfeited bid will be charged to account for the administrative expenses incurred to reassign the licence.

Any bidder who forfeits on a licence will be ineligible to bid on it in the re-auction of that licence. This restriction will also apply to any affiliate of the bidder.

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<sup>30</sup> Suppose that a bid of \$100,000 was withdrawn on licence X during the auction, and that no new bids were placed on that licence thereafter. The ultimate selling price of licence X will not be known until a subsequent re-auction and hence, the value of the withdrawal penalty cannot be calculated until that time. The full value of the withdrawn bid, \$100,000, would be used as the interim proxy penalty until the re-auction.

### 7.9.3 Eligibility Documentation

Bidders who are provisional licence winners will be required to submit the following documents within ten business days of the auction's close:

- A declaration as to whether the provisional licence winner **will** or **will not** be acting as a **radiocommunication carrier**.
- Eligibility documents, e.g., certificate of incorporation, if the provisional licence winner indicates it will not be acting as a radiocommunication carrier.
- A declaration regarding ownership and control, and related documents, if the provisional licence winner indicates that it will be acting as a radiocommunication carrier.<sup>31</sup>

The Department will review these documents on an expeditious basis. The Department will then notify each provisional winner as to whether it complies with the Canadian ownership and control requirements. In the event a provisional licence winner does not, in the opinion of the Department, comply with the Canadian ownership and control requirements, the Department will require that the provisional licence winner make changes in order to become compliant.

### 7.9.4 Issuance of Licences

A provisional winner of spectrum licences will have those licences issued to it on completion of the following: (1) payment of the sum of its standing high bids and the sum of its withdrawal penalties, if any; and (2), if the provisional winner will be acting as a radiocommunication carrier, a determination by the Department that the Canadian ownership and control requirements have been met. The Department expects that licences will be issued within forty-five business days of the auction's close.

## 8. Financial Aspects

### 8.1 Opening Bids

The Department believes that the spectrum being offered in this auction has a significant value and is confident that the revenues generated will cover the relevant spectrum management costs and provide fair compensation to the Canadian public for

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<sup>31</sup> See Industry Canada (April 1, 1999), *Canadian Ownership and Control* (CPC-2-0-15) (available on the Strategis Web site at <http://strategis.ic.gc.ca/spectrum>), as amended from time to time.

the use of their spectrum resource. Therefore, the establishment of irreducible reserve prices is likely unnecessary. In order to "kick-start" the auction and avoid unnecessary delays in ultimately assigning licences, however, the Department proposes to establish minimum opening bids. These opening bids are conceptually linked to the revenue generated by licences for similar spectrum in the 800 MHz cellular and 2 GHz PCS bands. The Department has calculated an estimate of the total amount of licence fees which the 'C' and 'E' blocks would provide over the licence term if they were licensed by traditional means.

Opening bids are proportional to the bidder eligibility points<sup>32</sup> associated with each licence. Bidder eligibility points are related to the population and bandwidth covered by a licence. As discussed in section 4.3.2, if sub-national licences are to be offered, the Department proposes to use Tier 2 service areas. Table 2 below provides a list of the Tier 2 service areas and their population, eligibility points, and opening bids. For each spectrum block of 10 MHz, a population of approximately 100,000 corresponds to 1 point. Opening bids have been calculated at \$100,000 per point.

**Table 2 - Proposed Opening Bids**

Licence	Service Area	Population	Points	10 MHz
2-01	Newfoundland/Terre-Neuve & Labrador	551,792	5	\$500,000
2-02	Nova Scotia & P.E.I./Nouvelle-Écosse & Î.-P.-É.	1,043,839	10	\$1,000,000
2-03	New Brunswick/Nouveau-Brunswick	738,133	10	\$1,000,000
2-04	Eastern Quebec/Québec-Est	1,609,690	15	\$1,500,000
2-05	Southern Quebec/Québec-Sud	5,035,827	50	\$5,000,000
2-06	Eastern Ontario/Ontario-Est & Outaouais	2,047,352	20	\$2,000,000
2-07	Northern Quebec/Québec-Nord	194,810	2	\$200,000
2-08	Southern Ontario/Ontario-Sud	8,179,887	80	\$8,000,000
2-09	Northern Ontario/Ontario-Nord	824,802	10	\$1,000,000
2-10	Manitoba	1,115,900	10	\$1,000,000
2-11	Saskatchewan	980,770	10	\$1,000,000
2-12	Alberta	2,704,291	30	\$3,000,000
2-13	British Columbia/Colombie-Britannique	3,724,500	40	\$4,000,000
2-14	Yukon, N.W.T./T.N.-O.	95,168	1	\$100,000
	<b>National Total</b>	<b>28,846,761</b>	<b>293</b>	<b>\$29,300,000</b>

**Note:** The total amount for 40 MHz of spectrum is \$117.2 million.

The Department's most important objective is of course to see spectrum assigned so that Canadians may ultimately receive services. Therefore, the Department would reserve the right to reduce the minimum opening bids on licences which received no bids during the initial rounds of the auction.

Comments are sought on the absolute and relative level of opening bids.

<sup>32</sup> See discussion of bidder eligibility points in section 7.7.1 of this document.

## 8.2 Pre-Auction Deposits

The Department feels that the integrity of an auction is enhanced by requiring all bidders to submit a pre-auction deposit. The deposit should be large enough to dissuade frivolous bidders from trying to enter the auction process while not so large that sincere bidders are unable to participate; additionally, the deposit should be large enough so that it covers all of a bidder's likely bid withdrawal and forfeiture penalties.<sup>33</sup> A pre-auction deposit must be submitted in the form of an irrevocable standby letter of credit.

The Department proposes to determine the amounts of pre-auction deposits on the basis of the opening bid per point. If, for example, a prospective bidder indicated that it wished to be able to bid on licences totalling 100 points, it would be required to submit a deposit of \$10,000,000 (\$100,000\*100).

The pre-auction deposit will be returned to any applicant that is found not to be a qualified bidder, to any applicant that provides written notification to the Department of its withdrawal from the process prior to the auction's commencement, and to any bidder whose eligibility is reduced to zero during the auction and who is not potentially liable for any withdrawal penalties.

Comments are sought on the proposed deposit amounts.

## 8.3 Bid Payment

Winning bidders will be required to submit 20 percent of their high bids and 100 percent of any withdrawal penalties incurred within 10 business days of the auction's close. This payment will be non-refundable. If the winning bidder fails to make this initial payment in a timely manner, the licence will not be issued and the bidder will be subject to the applicable forfeiture penalty. The remaining 80 percent of the high bids will be due within 30 business days of the auction's close. Failure by the winning bidder to make this final payment in a timely fashion will also result in the licence not being issued, and again, the bidder will be subject to the applicable forfeiture penalty.

It is also important to note that beyond the payment of the winning bid, no other licence fees or payments will be required for the duration of the licence term.<sup>34</sup>

## 9. Submitting Your Comments

All comments should refer to "Comments - *Canada Gazette* notice DGRB-018-99" and

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<sup>33</sup> See the discussion of withdrawal and forfeiture penalties in section 7.7.3 of this document.

<sup>34</sup> As per subsection 5(1)(1.3) of the *Radiocommunication Act*.

should be submitted electronically (in either WordPerfect, Microsoft Word, Adobe PDF or ASCII TXT format) to:

pcs.scp@ic.gc.ca

To ensure that all comments are duly considered, submissions must be received no later than February 16, 2000. These comments will be posted on the Industry Canada spectrum Web site by February 21, 2000.

Reply comments should refer to "Reply Comments - *Canada Gazette* notice DGRB-018-99" and should be submitted electronically (in either WordPerfect, Microsoft Word, Adobe PDF or ASCII TXT format) to:

pcs.scp@ic.gc.ca

To ensure that all reply comments are duly considered, submissions must be received no later than March 8, 2000. These reply comments will be posted on the Industry Canada spectrum Web site by March 13, 2000.

Printed copies of submissions may be obtained from:

ByPress Printing and Copy Centre Inc.  
300 Slater Street, Unit 101A  
Ottawa, Ontario  
K1P 6A6  
Phone: 613-234-8826  
FAX: 613-234-9464

Costs of duplication will be charged.

For further information concerning the process outlined in this document or related matters, contact:

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Phone: 613-990-7176  
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