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Spectrum Management and Telecommunications

Licensing Framework for Mobile Broadband Services (MBS) — 700 MHz Band

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1. Intent

1. Through the release of this paper, Industry Canada hereby announces the decisions resulting from the consultation process undertaken in *Canada Gazette* notice DGSO-002-12, *Consultation on a Licensing Framework for Mobile Broadband Services (MBS) — 700 MHz Band*.¹ This document serves as a companion document to the *Policy and Technical Framework: Mobile Broadband Services (MBS) — 700 MHz Band, Broadband Radio Service (BRS) — 2500 MHz Band*,² announced in *Canada Gazette* notice SMSE-002-12.

2. All comments and reply comments received in response to this consultation are available on Industry Canada's departmental website at <http://www.ic.gc.ca/spectrum>. Comments and/or reply comments were received from Bell Mobility Inc. (Bell), Bragg Communications Inc. (Eastlink), the British Columbia Broadband Association (BCBA), the Canadian Wireless Telecommunications Association (CWTA), Cogeco Cable Inc. (Cogeco), Data & Audio-Visual Enterprises Wireless Inc. (Mobilicity), the Eastern Ontario Regional Network (EORN), the Federation of Canadian Municipalities (FCM), Globalive Wireless Management Corp. (WIND), Dr. Helen Hambly Odame (of the University of Guelph), Ice Wireless, Dr. Michel Lincourt, MTS Allstream, Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), Public Interest Advocacy Centre (PIAC), Public Mobile Inc., Quebecor Media Inc. and Videotron G.P. (Quebecor), Rogers Communications Partnership (Rogers), SaskTel, Shaw Communications Inc. (Shaw), Sogetel Mobilité (Sogetel), SSi Group of Companies (SSi), Dr. Gregory Taylor and Dr. Catherine Middleton (of Ryerson University), Tbaytel, TELUS Communications Company (TELUS), and Xplornet Communications Inc. and Xplornet Broadband Inc. (Xplornet).

3. The following document (hereinafter referred to as the Framework) sets out the rules and procedures for participation in the competitive licensing process for spectrum in the 700 MHz band. The Framework includes: details related to the auction format and rules; the application process and timelines; and the conditions of licence that will apply.

2. Background

4. The Minister of Industry, through the *Department of Industry Act*, the *Radiocommunication Act* and the *Radiocommunication Regulations*, with due regard to the objectives of the Canadian telecommunications policy set out in section 7 of the *Telecommunications Act*, is responsible for spectrum management in Canada. As such, the Minister is responsible for developing national policies for spectrum utilization and ensuring effective management of the radio frequency spectrum resource.

¹ See DGSO-002-12, *Consultation on a Licensing Framework for Mobile Broadband Services (MBS) — 700 MHz Band* (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10363.html>).

² See SMSE-002-12, *Policy and Technical Framework: Mobile Broadband Services (MBS) — 700 MHz Band, Broadband Radio Service (BRS) — 2500 MHz Band* (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10223.html>).

5. In developing a licensing framework for MBS in the 700 MHz band, Industry Canada has been guided by the objectives stated in section 7 of the *Telecommunications Act*, the policy objective stated in the *Spectrum Policy Framework for Canada*³ (SPFC) to maximize the economic and social benefits that Canadians derive from the use of the radio frequency spectrum, and the policy objectives outlined in SMSE-002-12,⁴ as follows:

- sustained competition in the wireless telecommunications services market so that consumers and businesses benefit from competitive pricing and choice in service offerings;
- robust investment and innovation by wireless telecommunications carriers so that Canadians benefit from world-class networks and the latest technologies; and
- availability of these benefits to Canadians across the country, including those in rural areas, in a timely fashion.

6. Industry Canada was also guided by the general approaches and processes outlined in the *Framework for Spectrum Auctions in Canada* (FSAC),⁵ which was revised in March 2011.

7. Industry Canada makes no representation or warranties about the use of this spectrum for particular services. Applicants should be aware that this auction represents an opportunity to become a licensee, subject to certain conditions and regulations. An Industry Canada auction does not constitute an endorsement by the Department of any particular service, technology or product, nor does a spectrum licence constitute a guarantee of business success. Applicants should perform their individual due diligence before proceeding as they would with any new business venture.

3. General

8. In SMSE-002-12, *Policy and Technical Framework: Mobile Broadband Services (MBS) – 700 MHz Band, Broadband Radio Service (BRS) – 2500 MHz*, Industry Canada announced specific policy decisions related to the licensing process for spectrum in the 700 MHz band. Consistent with those decisions, the following provides an overview of the licences to be auctioned:

- licences will be “spectrum licences in respect of the utilization of specified radio frequencies within a defined geographic area,” as defined in subparagraph 5(1)(a)(i.1) of the *Radiocommunication Act*;
- licences will be auctioned using Tier 2 service areas (14 service areas) for all frequency blocks;
- a total of five blocks of paired spectrum and two blocks of unpaired spectrum will be available in each service area (seven licence blocks);
- a total of 98 licences will be offered;
- a spectrum cap of two paired frequency blocks will apply to all licensees; the unpaired blocks will not be subject to a spectrum cap;

³ See *Spectrum Policy Framework for Canada* (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08776.html>).

⁴ See SMSE-002-12, *Policy and Technical Framework: Mobile Broadband Services (MBS) – 700 MHz Band, Broadband Radio Service (BRS) – 2500 MHz Band* (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10121.html>).

⁵ See *Framework for Spectrum Auctions in Canada* (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01626.html>).

- a spectrum cap of one paired spectrum block from within blocks B, C, C1 and C2 will apply to all large wireless service providers.⁶

9. For a complete list of policy decisions related to the 700 MHz band, refer to Section B of SMSE-002-12.⁷

10. The following frequency blocks will be available in all 14 service areas for the 700 MHz auction.

Table 1 – Block size for spectrum in the 700 MHz band

Block	Frequency	Pairing	MHz
A	698-704 MHz/728-734 MHz	paired	6+6 MHz
B	704-710 MHz/734-740 MHz	paired	6+6 MHz
C	710-716 MHz/740-746 MHz	paired	6+6 MHz
D	716-722 MHz	unpaired	6 MHz
E	722-728 MHz	unpaired	6 MHz
C1	777-782 MHz/746-751 MHz	paired	5+5 MHz
C2	782-787 MHz/751-756 MHz	paired	5+5 MHz

3.1 Service Area for Lloydminster (Alberta/Saskatchewan)

11. The issue surrounding Lloydminster was raised by SaskTel in response to SMSE-005-11, *Decisions on a Band Plan for Broadband Radio Service (BRS) and Consultation on a Policy and Technical Framework to License Spectrum in the Band 2500-2690 MHz*, where it proposed that tier area boundaries around Lloydminster are worthy of further consideration by Industry Canada.

12. In its consultation, Industry Canada sought comments on whether the service area boundary for licences in the 700 MHz band should deviate from the provincial boundary around the City of Lloydminster (Alberta/Saskatchewan).

Summary of Comments

13. Three respondents commented on this issue. Rogers and TELUS both indicated that the status quo should prevail. TELUS noted that as 65% of the Lloydminster population lives on the Alberta side of the border, having two operators serving the border area could result in additional roaming charges for customers. It added that significant coordination would be required and that although radio frequency (RF) optimization can mitigate some interference, wireless users in the centre of the city would bounce back and forth between networks, resulting in a high number of dropped calls and customer dissatisfaction.

⁶ Large wireless service providers are defined as companies with 10% or more of the national wireless subscriber market share, or 20% or more of the wireless subscriber market share in the province of the relevant licence area. The subscriber market share for Ontario will apply for the licence area 2-06, Eastern Ontario and Outaouais. For the Tier 2-14 licence area (Yukon, Northwest Territories and Nunavut), only the national market share criteria will apply.

⁷ SMSE-002-12, *Policy and Technical Framework: Mobile Broadband Services (MBS) – 700 MHz Band, Broadband Radio Service (BRS) – 2500 MHz Band* (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10121.html>).

14. SaskTel supports changing the boundary for service areas covering Lloydminster so that it aligns with the provincial boundary. It indicated that any entity currently seeking a Saskatchewan-wide licence would be required to obtain a licence that includes Edmonton, Alberta, and that would not be cost-effective. As for interference concerns, SaskTel indicated that new technologies can be and are being used to mitigate potential interference. SaskTel also added that the current spectrum map has caused divisions between the two primary providers in the area and that it has been contrary to the interests of the residents of Lloydminster.

Discussion

15. Industry Canada uses service areas, called tiers, for all competitive licensing processes. These areas are based on Statistics Canada's Census Divisions and Subdivisions. Four tier sizes, as outlined in the document *Service Areas for Competitive Licensing*,⁸ have been established to accommodate various wireless services, applications and frequency bands.

16. The tier service areas were introduced in 1998 following a public consultation that stemmed from the amendments to the *Radiocommunication Act*, which introduced a new approach to spectrum licensing in 1996. At the time of consultation, there was general agreement among stakeholders and, to reduce possible interference issues and keep economic areas intact, deviations were made around provincial borders.

17. The deviations occur in five areas of the country where the use of provincial borders would divide a contiguous economic zone in two. These are comprised of one large population area (Gatineau/Ottawa) and four smaller areas, including the City of Lloydminster, which lies on the border of Saskatchewan (35% of the population) and Alberta (65% of the population). Based on population distribution, the decision was made in 1998 to draw the tier boundary such that the City was in the Alberta tier areas, as that is where the majority of the population resides.

18. Maintaining the current tier area structure would be consistent with all other spectrum auction processes undertaken since 1999 and would allow existing licensees serving the tier area to make use of their existing infrastructure to overlay the additional spectrum.

19. Given the current tier structure, an entity wanting licences to cover all of Saskatchewan would also have to acquire a licence in the Alberta tier area.

20. Redrawing the tier area boundary to follow the provincial border could result in increased interference challenges; however, new technologies may be effective in mitigating interference.

⁸ *Service Areas for Competitive Licensing* (http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01627.html).

Decision

21. **Based on the above, Industry Canada considers that for the 700 MHz auctioned licences, the tier boundary will align with the Alberta/Saskatchewan provincial border in Lloydminster.**

4. Auction Format and Rules

22. As stated in the FSAC, Industry Canada's objective is to select an auction design that is optimal for the spectrum being offered and the circumstances that exist at the time. In most of its past auctions, Industry Canada has used a simultaneous multiple round ascending (SMRA) auction format. Advances in auction theory and design have led to the development of new auction formats and rules. One of these new auction formats is the combinatorial clock auction (CCA) format, which is a variation of the SMRA format in that all licences are auctioned at the same time over multiple rounds.

4.1 Auction Format

23. Industry Canada sought comments on its proposal to use the CCA format for the 700 MHz auction.

Summary of Comments

24. Bell, Public Mobile, Rogers, TELUS and WIND noted the overall advantages of the CCA format and supported its use for the 700 MHz auction.

25. Regional operators (Eastlink, MTS Allstream, Quebecor, SaskTel, Shaw, Sogetel, SSI, Tbaytel and Xplornet) expressed concerns that the proposed auction format and rules favour national bidders. In particular, they argued that a national bid may be able to trump the bids of regional bidders. Eastlink, SaskTel and Sogetel suggested the use of the SMRA format.

26. Some respondents expressed concerns about the overall complexity of the proposed auction format (Mobicity, SaskTel, Sogetel, Tbaytel, TELUS and Xplornet), including bidding in the auction (Xplornet and Tbaytel) and winner and price determination (Eastlink).

27. To address their concerns about the format, some respondents suggested that bidding in the supplementary round be restricted to: packages bid on in the clock rounds (Quebecor); packages that include at least the bidder's final clock package (Quebecor); unallocated licences (MTS Allstream and Mobicity); or to bidders that have a final clock package (Quebecor). Bell disagreed with the suggestions to restrict supplementary round bidding to only packages that include a bidder's final clock package. Rogers and TELUS submitted that they do not support Quebecor's proposals, whereas Public Mobile stated that it supports the intentions of Quebecor's proposals, but that the solutions proposed by Quebecor create several problems.

28. SaskTel proposed that the winning combination of packages “satisfy a constraint that every bidder has to win a package that includes at least its final clock package.” Bell and TELUS did not support this recommendation.

29. Some respondents suggested that the supplementary round be eliminated entirely (SaskTel, Shaw and SSi) or if all licences are allocated in the final clock round (Eastlink, MTS Allstream and SaskTel). SSi also suggested that if there are unallocated licences after the clock rounds, those licences should be subject to a new auction. Bell, Rogers, Public Mobile and TELUS submitted that they do not support the suggestion to omit the supplementary round.

30. Rogers proposed that bidders not be allowed to place bids for packages that include upper block licences at the same time as the lower A block, or for packages that include both the A and D/E blocks without also including a bid in the B/C blocks. In their reply comments, Quebecor and Xplornet supported Rogers’ proposal, whereas Bell, MTS Allstream, TELUS and WIND did not, arguing that it would reduce bidding flexibility. Bell, however, recommended that Industry Canada not allow bidders to place bids on packages which contain both lower and upper “prime” spectrum in the same licence area.

Discussion

31. The CCA format was proposed for the 700 MHz auction, as it utilizes package bids, eliminating the risk that bidders win some but not all of the licences needed for their business case, known as exposure risk. This auction format reduces complexity for bidders in that they can bid on the entire packages of licences that they want on an all-or-nothing basis rather than trying to put together a package comprised of individual licences. The format makes it easier for bidders to move to substitute licences in response to price changes given that, unlike the SMRA auction format, it does not require the identification of a ‘standing high bidder’ that is held responsible for individual licences at the end of each round. Furthermore, the format reduces opportunities for anti-competitive behaviour during the auction.

32. *Return to the SMRA auction format:* The SMRA auction format is familiar to and well understood by stakeholders, as it has been used in five of seven spectrum auctions in Canada. However, in an SMRA auction, a bidder seeking multiple licences could be subject to exposure risk (refer to Annex A). This could lead to complicated bidding strategies, particularly for a bidder with a large package of licences, and potentially result in a less efficient outcome. The restricted bidding flexibility resulting from the spectrum aggregation limits could increase this complexity.

33. Package bidding is particularly important for the 700 MHz band, where two distinct ecosystems have developed in the United States, namely the AT&T ecosystem (blocks B and C) and the Verizon ecosystem (blocks C1 and C2). Equipment from one ecosystem cannot be used in the other. As such, if bidding were for individual licences, as in an SMRA auction, there would be a risk that a bidder interested in either blocks B/C or blocks C1/C2, but not both could get stranded with some licences for one ecosystem and some licences for the other ecosystem. The regional nature of the licences also increases the exposure problem for bidders seeking licences across multiple service areas.

34. *Concerns of regional respondents:* Spectrum aggregation limits have been implemented in order to facilitate at least four bidders obtaining spectrum in each service area. Based on the current mix of licensees in Canada, this will provide opportunities to both regional and national carriers in each service area. The objective of the auction is an efficient assignment of licences, where licences are assigned to those who value them the most and thus are most likely to deploy them and offer services. The CCA format is effective in this regard, as it permits bidders to submit bids up to their valuation, with full confidence that they will not be stranded with only some of the licences that they need. Winning bids are determined by the highest value combination of package bids with each bidder winning at most one of its package bids.

35. *Concerns regarding complexity:* The CCA format is new and for potential bidders who are not familiar with the format, it may take additional effort to understand it thoroughly. The complexity concerns raised by stakeholders can be addressed through increased training, including early access to the winner and price determination software (the solver) and additional mock auctions.

36. *Complexity of winner and price determination:* In a CCA, calculations are made to determine the winning bidders, licences won and prices to be paid. The solver is required for the determination process given the number of possible combinations of packages that might be present. It may be unfamiliar to potential bidders, as it was not used in previous Canadian spectrum auctions.

37. To provide transparency and increase familiarity with the process for winner and price determination in the CCA, Industry Canada has provided the winner and price determination explanations for the process (Annex B) and has published details of the algorithm that will be used to determine winning bidders and prices to be paid.⁹ Industry Canada is also planning to release bidding information after the conclusion of the auction.

38. *Eliminating or restricting bidding in the supplementary round:* The supplementary round is a fundamental part of the CCA format. In each clock round, bidders are limited to bidding on a single package at given prices. However, as there may be many packages that a bidder is interested in and eligible to bid on, the supplementary round gives bidders the opportunity to place their best and final bids on these packages at prices reflecting the valuation that they have for the combination of licences. These supplementary bids are critical in ensuring that the licences are allocated to the bidders that value them the most and in ensuring that winning bidders pay an amount that is sufficient to ensure that no other bidder or group of bidders was willing to pay more for the licences.

39. *Restricting what bids can be won:* SaskTel's proposal that the winning combination of packages should "satisfy a constraint that every bidder has to win a package that includes at least its final clock package" would provide more certainty to bidders, as they would know what they would win at a minimum. However, the constraint could result in a less efficient outcome where there would be other bidders willing to pay more than the winning bidder. It could also create incentives and opportunities for anti-competitive behaviour, as bidders could submit bids for licences that they are not interested in for the sole purpose of causing price damage to others, with little or no risk to themselves.

⁹ See *Mathematical Formulations for Winner and Price Determination in the Combinatorial Clock Auction for Mobile Broadband Services (MBS) – 700 MHz Band* (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08697.html>).

40. *Restricting allowable packages:* It is expected that a bidder could have a legitimate demand for any combination of the spectrum blocks available in the auction given the length of the licence term and potential ecosystem developments over the course of the licence term. Imposing additional constraints on allowable packages could reduce a bidder's flexibility to make decisions during the auction, based on the price discovery information it is receiving and its own valuation of the spectrum.

Decision

41. **In consideration of the above, Industry Canada will use the CCA format, including the supplementary round. Additional training, including early access to the winner and price determination tool and additional mock auctions, will be provided as set out in Section 9 – *Bidder Training and Support*. Further details on the CCA format are provided in Annex B.**

4.1.1 Categories of Generic Licences

42. Generic licences are blocks of spectrum that are similar enough and of comparable value such that they can be offered in a single category. A category can include a single licence or a group of generic licences for each service area. A category in a given service area is referred to as a product. Industry Canada sought comments on the following proposed categories of generic licences in each service area:

- blocks B and C in the lower 700 MHz band (two paired generic licences);
- blocks D and E in the lower 700 MHz band (two unpaired generic licences); and
- blocks C1 and C2 in the upper 700 MHz band (two paired generic licences).

43. Industry Canada proposed that block A be a separate fourth category in each service area.

44. Industry Canada also proposed that if a bidder wins block A and one of blocks B and C in a service area, then that bidder would automatically be assigned blocks A and B in that service area.

Summary of Comments

45. Bell, Rogers, SaskTel, Sogetel, TELUS, WIND and Xplornet supported the proposed categories of generic licences and the proposal to guarantee contiguity across blocks A and B in a given service area.

46. MTS Allstream submitted “that blocks B and C in the Lower 700 MHz band should not be treated as generic licences, since some bidders will value block B spectrum more than block C spectrum.” This comment was supported by Quebecor in its reply comments.

47. Public Mobile did not support the proposal to guarantee contiguity as it “distorts the value of the Lower A and Lower B blocks so that the Lower B block ceases to be ‘generic’.”

48. Rogers recommended that Industry Canada combine the D and E blocks into a single block “which would better reflect bidders’ true demand for the spectrum and prevent abuse.” Bell, MTS Allstream and TELUS disagreed with Roger’s proposal, arguing that it would reduce flexibility for bidders that are only interested in one unpaired block.

49. Rogers proposed that a bidder be automatically assigned contiguous spectrum when it “wins one of the D and E licences and one of the B and C licences in a given service area,” as it would greatly simplify the assignment stage. To facilitate this, it suggested an alternative hierarchical approach wherein contiguity across blocks A, B/C and D/E within each service area would be resolved first based on a set of rules, then on geographic contiguity across adjacent service areas, and finally, on an assignment round for the unresolved assignments. Bell, MTS Allstream and Public Mobile disagreed with the recommendation for contiguity across blocks B/C and D/E; in addition, Bell and SaskTel disagreed with Rogers’ proposal on how to resolve potential contiguity conflicts across service areas.

Discussion

50. The use of generic licences enhances the possibility of substitution and reduces the number of combinations on which bids may be placed, simplifying the bidding process for bidders. The proposed generic licence categories were determined based on the anticipated substitutability of the blocks. Considerations included frequency location in the band, block size, technology and interference constraints.

51. *Separating blocks B and C:* Although the demand for block B may be higher than for block C given the current ecosystem, blocks B and C are technological substitutes. Any additional value that a bidder places on the individual licence is because it can be paired with another licence. Keeping blocks B and C together will be simpler for bidders, as there will be fewer products (56 instead of 70) and fewer possible combinations, facilitating substitution and expediting the auction.

52. *Removing the guarantee of contiguity across blocks A and B:* The proposal to guarantee contiguity across blocks A and B recognizes that contiguous spectrum is technologically more efficient and therefore preferable. The guarantee will reduce predatory bidding in the assignment stage, where a bidder that wins one B/C licence could place insincere bids to make the AB combination impossible or more expensive for its competitor. While the possibility does exist that a bidder may find itself with AB licences in some service areas and C licences in others, contiguity across blocks in a service area is considered more important than a consistent block across service areas.

53. *Combining D and E into a single block:* Decisions with respect to block size were announced in SMSE-002-12, *Policy and Technical Framework: Mobile Broadband Services (MBS) – 700 MHz Band, Broadband Radio Service (BRS) – 2500 MHz Band*. Licensing the unpaired blocks in the lower 700 MHz as two separate blocks rather than a single block provides flexibility for bidders that are only interested in one unpaired block. Bidders interested in both blocks can still bid for them without risking winning only one of the blocks.

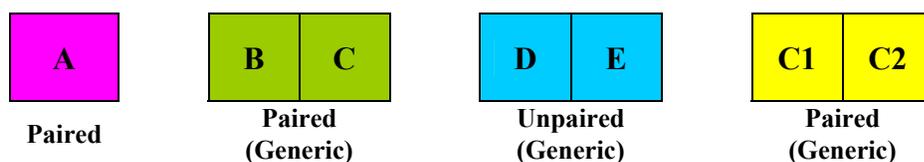
54. *Guarantee of contiguity across blocks B/C and D/E:* Anticipated future use of the lower D and E blocks involves mobile broadcasting and/or mobile broadband supplemental downlink, which suggests that the blocks will not be used in conjunction with other 700 MHz spectrum; hence, a guarantee of contiguity is not considered to be necessary. Any bidder that has a preference for specific licences will be able to express that preference in the assignment stage.

55. *Further rules for contiguity*: Prioritizing contiguity first within a service area and then across specified pairs and groups of regions would further complicate the auction and could disadvantage bidders that would not have an opportunity to express their preference either within or across regions.

Decision

56. Based on the above, the categories of generic licences will be as proposed. Table 2 illustrates the categories for each of the 14 Tier 2 service areas. Category A includes a single licence block, whereas the other three categories include two generic licence blocks.

Table 2 – Categories of licences in each service area



57. In addition, a bidder will automatically be assigned the A and B licences in a given service area if the bidder wins the A licence and one of the B and C licences in the same service area.

4.1.2 Structure of the Assignment Rounds

58. Industry Canada proposed to run three sequential assignment rounds (i.e. one for each category of generic licences): blocks B and C; blocks D and E; and blocks C1 and C2.

Summary of Comments

59. Bell supported the structure for the assignment rounds as proposed.

Discussion

60. The structure for the assignment rounds was proposed to allow bidders that have won licences in the same category of generic licences across multiple service areas to express their preferences for particular licences.

61. The only suggestion for change related to the assignment rounds was Rogers' suggestion with respect to added rules for contiguity across blocks of licences, discussed in Section 4.1.1.

Decision

62. In consideration of the above, Industry Canada will conduct the assignment rounds as proposed. Industry Canada will run three sequential assignment rounds (i.e. one for each category of generic licences): blocks B and C; blocks D and E; and blocks C1 and C2.

4.1.3 Activity Rule – Clock Rounds

63. Industry Canada sought comments on the proposal to use an activity rule for the clock rounds that is a combination of the eligibility-based activity rule used in previous SMRA auctions and a revealed preference activity rule. The revealed preference activity rule allows a bidder to bid on a package that exceeds its current eligibility provided that it has become relatively less expensive than packages that the bidder has bid on in all previous eligibility-reducing rounds.

Summary of Comments

64. Bell, SaskTel, Sogetel, TELUS and WIND supported the proposed activity rule for the clock rounds.

65. Rogers stated that the proposed activity rule is too restrictive and suggested that bids on packages that exceed a bidder's current eligibility only be subject to revealed preference with respect to the last clock round in which the bidder had sufficient eligibility to bid on the package. In the reply comments, Public Mobile supported Rogers' proposed changes, whereas Bell did not. TELUS submitted that it would support Rogers' recommendation for a more relaxed revealed preference activity rule in the clock rounds "as long as the bid still satisfied the revealed preference constraints at each intermediate eligibility-dropping juncture between the current round, and the last round at which the bidder had the desired level of eligibility."

66. Public Mobile commented that the rules on eligibility points may distort bidding by encouraging bidders to bid on packages with relatively more eligibility points rather than on their most preferred package in order to maintain their eligibility for later rounds; however, Public Mobile recognized that the revealed preference limit should help to mitigate its concern.

Discussion

67. The clock rounds activity rule for the 700 MHz auction was proposed to provide bidders with the motivation and flexibility to always bid on their most preferred package, improving price and allocation discovery in the clock rounds. Using only an eligibility-based activity rule in the clock rounds would prevent a bidder from placing bids on its most preferred package if that package exceeds its eligibility.

68. A bidder is always able to place bids that are consistent with its eligibility points. However, adding the revealed preference activity rule affords extra flexibility to the bidder by allowing it to bid on a larger preferred package that has become relatively less expensive, providing an easy way for bidders to adjust their bid in response to information received in the clock rounds.

69. *Reduce the number of revealed preference constraints:* There is a trade-off in setting the activity rule in the clock rounds. On the one hand, many constraints help to promote truthful bidding and hence price discovery and, on the other hand, fewer constraints allow bidders the flexibility to revise bids in response to price and demand information. The proposed activity rule strikes a balance; it supports bidders being able to revise their bids consistently with their underlying values, yet it does not undermine price discovery. Bidders will also have the opportunity to place bids in the supplementary round for packages that they did not bid on in the clock rounds.

70. *Bidding on larger packages to maintain eligibility:* As noted by Public Mobile, the revealed preference activity rule mitigates the incentive that bidders may have to bid on larger packages to maintain eligibility. As well, in a CCA, all bids are binding, so the risk associated with bidding on unwanted licences in order to maintain eligibility points is increased given that a bidder could ultimately win that package.

Decision

71. Industry Canada will use an activity rule for the clock rounds that is a combination of the eligibility-based activity rule and the revealed preference activity rule as proposed.

72. Further information on the activity rule for the clock rounds can be found in Annex B. As well, a detailed example of the activity rule is included in Annex C and an algebraic description of the revealed preference activity rule is included in Annex D.

4.1.4 Activity Rule – Supplementary Round

73. Industry Canada sought comments on its proposal to use an activity rule in the supplementary round based on revealed preference limits with respect to the bids submitted in the clock rounds. The rule would require that all of a bidder's supplementary bids satisfy revealed preference with respect to the final clock round and with respect to clock rounds where it reduced eligibility points beginning with the last clock round in which the bidder was eligible to bid on the package.

74. There were two exceptions: (1) bids on the final clock package could be an unlimited amount; and (2) bids on a package comprised of the final clock package plus any or all licences provisionally unallocated in the final clock round would be required to satisfy revealed preference with respect to the final clock round only.

75. The revealed preference limit with respect to the final clock round provides an opportunity for bidders to guarantee winning their final clock round packages.

Summary of Comments

76. Bell, WIND and Sogetel supported the proposed activity rule for the supplementary round.

77. Quebecor, SaskTel, MTS Allstream and Eastlink expressed concerns that only larger bidders would have the financial resources to be able to guarantee winning their final clock package and that even if a smaller bidder is able to submit the required bid increase for the guarantee, this amount would be far less restrictive for a large national bidder given that the increment is the same for all bidders.

78. SaskTel proposed that in order to guarantee winning one's final clock package, a bidder should only have to increase the bid amount of its final clock package by the value of the unallocated licences in service areas where it bid in the final clock round. Only Xplornet stated that it supports this proposal.

79. Mobilicity submitted that with the proposed activity rule, there is scope for insincere bidding in the supplementary round, suggesting that some bidders may not have the incentive to reveal all their preferences so as to not reduce the likelihood of winning their most preferred package, whereas other bidders may have an incentive to place bids to raise the prices for winning bidders.

80. Rogers submitted that the proposed activity rule could lead to strategic behaviour, allowing bidders to place bids on packages that they do not necessarily want merely to increase the prices for the winning bidders. It recommended eliminating the revealed preference constraint with respect to the final clock round and only applying the revealed preference constraint to the last clock round in which the bidder was eligible to bid on the package. In the reply comments, Public Mobile supported Rogers' proposal, whereas Bell, MTS Allstream, Quebecor and TELUS did not. MTS Allstream submitted that additional revealed preference constraints should be applied to supplementary round bids such that they are "consistent with the clock round revealed preference rule, rather than the reverse as proposed by Rogers."

81. In addition, Rogers did not support the two exceptions to the proposed supplementary round activity rule for a bidder's final clock package and for final clock packages plus unallocated licences, and recommended that revealed preference constraints be applied to all packages, including the final clock package when it exceeds the bidder's eligibility in the final clock round. In the reply comments, TELUS supported Rogers' recommendation, submitting that the only uncapped bid in the supplementary round should be the last bid in the clock rounds that did not exceed the bidder's final eligibility. Bell did not support Rogers' recommendation.

82. In its reply comments, WIND indicated "that an auction consistent with Industry Canada's objectives could be conducted" using the modified activity rules for the supplementary round proposed by Rogers, "so long as bidders active on spectrum in the final clock round are still allowed to purchase excess supply (if any) at final clock round prices."

Discussion

83. The activity rule in the supplementary round was proposed to motivate truthful bidding throughout the auction, promoting greater price discovery in the clock rounds and more certainty regarding the auction outcome. This occurs because a bidder's supplementary bids are constrained by its bids in eligibility-reducing rounds as well as the final clock round, and the bidder does not know which will be the final clock round. In addition, the revealed preference constraint with respect to the final clock round reduces the likelihood that the results of the final clock round will be overturned and it provides bidders with the ability to guarantee that they win their final clock package.

84. Although the proposed activity rule has several advantages, the strong predictability between the final clock allocation and the outcome of the supplementary round could have unintended consequences for bidder incentives in the supplementary round. Bidders could have an incentive to place risk-free supplementary bids that have no chance of winning and that serve only to increase the payments of their competitors. On the other hand, because of the strong predictability, bidders may decide that they have no compelling need to submit supplementary bids, which could potentially result in a less efficient outcome.

85. *Other options:* Given the aforementioned unintended consequences of the proposed activity rule, Industry Canada has considered other activity rules that would sufficiently preserve the strong incentives for truthful bidding during the clock rounds but also during the supplementary round.
86. The activity rule proposed by Rogers, known as the relative cap, would require that all supplementary bids only satisfy revealed preference with respect to the last round in which the bidder was eligible to bid on the package. Truthful bidding would still be encouraged in the clock rounds and in the supplementary round, as all bids are binding. However, as there are fewer constraints relative to previous bidding behaviour, price discovery could be impeded.
87. An alternative option would be to maintain the activity rule as proposed in the consultation but to withhold the aggregate demand information from the final clock round until the end of the auction. Similar to the proposal, this option would provide strong incentives for truthful bidding; however, it would reduce the opportunity for bidders to place risk-free bids that have no chance of winning and that serve only to increase the payments of their competitors. Furthermore, the amount needed to guarantee that a bidder wins its final clock package would be unknown.
88. *Concerns that the activity rule favours larger bidders:* Industry Canada acknowledges the concerns expressed that the bid increment that a bidder could be required to make in the supplementary round to guarantee winning its final clock package could be less restrictive for a larger bidder than for a smaller bidder and has considered other options for the activity rule in the supplementary round.
89. *Concerns about the proposed exception for a bidder's final clock package:* The intent of the exception for a bidder's final clock package is to make the process for submitting supplementary bids more intuitive while still encouraging truthful bidding throughout the auction.
90. *Concerns about the proposed exception for a bidder's final clock package plus unallocated licences:* The proposed exception that the final clock package plus unallocated licences only needs to satisfy revealed preference with respect to the final clock round was intended to provide more flexibility to bidders. However, the proposed exception for a bidder's final clock package plus unallocated licences would no longer be practical with the alternative option considered above, as bidders would not know which licences are unallocated. In addition, if applied with the relative cap option, it could prove more restrictive.

Decision

91. Based on the above considerations, Industry Canada has decided to use the alternative option, which includes withholding the final clock aggregate demand information from bidders. Furthermore, the activity rule will require that all of a bidder's supplementary bids satisfy revealed preference with respect to the final clock round and with respect to all clock rounds where it reduced eligibility points beginning with the last clock round in which the bidder was eligible to bid on the package. The only exception is that the supplementary bid for a bidder's final clock package can be of an unlimited amount. This exception also applies where a bidder's final clock package exceeded its eligibility in the final clock round due to the revealed preference activity rule.

92. **Further information on the activity rule for the supplementary round can be found in Annex B. As well, a detailed example of the activity rule is included in Annex C and an algebraic description of the revealed preference activity rule is included in Annex D.**

4.1.5 Pricing Rules

93. Industry Canada sought comments on the proposal to use a second-price rule to determine the price that winning bidders would be required to pay. A second-price rule requires each winning bidder to pay an amount that is sufficient to ensure that no other bidder, or group of bidders, was prepared to pay more than the winning bidder for the licence(s) in question.

94. More specifically, Industry Canada proposed to apply bidder-optimal core prices and to use a “nearest Vickrey” approach to determine second prices. In some cases, the second price (Vickrey price) may not be high enough to ensure that there is no alternative bidder or group of bidders prepared to pay more for the licences in question, and so an additional payment above Vickrey prices is required. In the event that such a payment is required, Industry Canada proposed to weight the portion of the additional payment to be paid on the winning package sizes evaluated at the opening bid prices.

Summary of Comments

95. Bell, MTS Allstream, Public Mobile, Rogers, Sogetel, Tbaytel, TELUS, WIND and Xplornet supported the proposal to use a second-price rule.

96. MTS Allstream and Sogetel supported weighting additional payments based on opening bid prices, as proposed in the consultation paper.

97. Rogers, supported by Bell in the reply comments, suggested that payments be split equally among bidders rather than weighted based on package size. Rogers argued that the proposed weighting is not equitable for bidders and that it provides a bidder with a large package of licences greater incentive to shade its bids in order to reduce its share of the increase in price due to the weighting, which would cause prices to increase disproportionately for bidders with small packages of licences.

98. Several respondents suggested using different weightings for additional payments, including winning bids (Public Mobile and Xplornet), final clock round prices (SaskTel, Tbaytel and TELUS) or a ratio of final clock round prices or winning bids to opening bid prices (Tbaytel and Xplornet).

Discussion

99. A second-price rule was proposed, as it promotes a more efficient outcome by increasing the incentive for bidders to bid in a way that is consistent with how they truly value the licences. Bidders, knowing that they will only be required to pay the amount determined by the second-price rule, will have a greater incentive to bid truthfully during the entire auction. This promotes an efficient auction outcome.

100. Weighting additional payments based on the winning package size was proposed because it ensures that each bidder’s share of the additional payment is in relation to the size of its package.

101. *Splitting additional payments equally*: Splitting the additional payment equally, as proposed by Rogers, would favour bidders with large packages of licences, as the additional payment would represent a smaller amount relative to their package size. Moreover, weighting the additional payment based on the winning package sizes is unlikely to result in bid shading given that it will be difficult to predict the combination of packages that will create this situation, the bidders affected and the amount of the additional payment required.

102. *Alternative weighting approaches*: Different approaches for weighting the additional payment based on the winning package sizes should give the same or similar result; however, different approaches may impact the incentive to bid truthfully during the auction. By weighting the additional payment using opening bid prices, bidders are not able to adjust their share of the additional payment based on their own bids, which will encourage truthful bidding.

Decision

103. In consideration of the above, Industry Canada will implement the pricing rules as proposed, including bidder-optimal core prices, and use of the “nearest Vickrey” approach to determine prices. In the event that an additional payment above Vickrey prices is required, the portion of the additional payment to be paid by each bidder will be weighted based on the winning package sizes as evaluated at the opening bid prices. Further information on the pricing rule is provided in Annex E.

4.1.6 Reserve Bidder

104. In the consultation paper, a “reserve bidder” approach was proposed wherein Industry Canada would act as though it was a bidder in the auction, placing a bid on every licence at the opening bid price. This approach would ensure that the incremental amount bid for an additional licence was at least the opening bid price for that licence.

Summary of Comments

105. Rogers and Public Mobile did not support the proposed approach, submitting that it could lead to unsold blocks even when there is demand for those blocks. In their reply comments, Bell, MTS Allstream and TELUS did not support the proposal either.

106. In its reply comments, Sogetel indicated that it supports this approach, as it reduces the bid increment required to guarantee winning a bidder’s final clock package. MTS Allstream submitted that if Industry Canada eliminates or reduces the proposed approach, then it “should ensure that doing so would not otherwise increase the cost of the guarantee bid required to secure bidders’ final clock packages.”

Discussion

107. The opening bid price for each licence is the minimum that Industry Canada would accept for the licence. The approach proposed by Industry Canada, known as the reserve bidder approach, operationalizes this view in a CCA by requiring that the incremental amount that a bidder bids on an additional licence be at least the opening bid price of that licence.

108. In all CCAs to date, bidders were required to bid at least the sum of the opening bid prices for all licences included in their package. This is known as the bounds only approach. If a bidder places a bid on a package at a price that is higher than the sum of the opening bid prices for these licences, the bidder can potentially add licences to its package without having to increase the total amount bid. Under the reserve bidder approach, if a bidder wants to add another licence to its package, it must increase the amount bid by at least the opening bid price of that licence.

109. The reserve bidder approach does not favour one particular type of bidder. The bounds only approach implicitly favours bidders with a large package of licences, as bidding above the opening bid price on more licences could make it easier to include additional licences in a package without having to increase the amount bid.

Decision

110. In consideration of the above, Industry Canada will use the reserve bidder approach as proposed.

4.1.7 Information Disclosure to Bidders During the Auction

111. Industry Canada sought comments on the proposal to use anonymous bidding during the clock rounds, revealing to each bidder only its own bid information from the previous round and its eligibility for the next round. All bidders would be informed of the aggregate demand for each product from the previous round and the price of each product for the next round.

112. Industry Canada proposed to inform all bidders at the end of the allocation stage about the number of winning bidders and the total number of licences allocated, and to inform each bidder of its own winning package, along with the base price to be paid.

113. Industry Canada proposed that participating bidders be notified of the specific licences that they had won and the assignment price(s) to be paid at the end of the assignment stage.

Summary of Comments

114. MTS Allstream, PIAC, Public Mobile, Rogers, SaskTel, Sogetel and WIND all supported the use of anonymous bidding during the clock rounds. Bell stated that it does not support the use of anonymous bidding and that “at a minimum, it is appropriate to know what packages other bidders are bidding on at each round.” In its initial comments, TELUS supported anonymous bidding, but reversed its position in its reply comments.

115. Rogers proposed that “Industry Canada release full information about all winning bids and bidders” after the conclusion of the allocation stage. TELUS supported Rogers’ proposal.

Discussion

116. *Publication of bidder names and current bids following each round:* The proposal by Bell not to use anonymous bidding (supported by TELUS in the reply comments) could result in bidders focussing on the bidding behaviour of other individual bidders rather than on their own valuations in relation to the price and demand information. It would also increase the potential for gaming and anti-competitive behaviour, complicating the bidding process for bidders and possibly leading to a less efficient outcome. For these reasons, auctions around the world in recent years have featured anonymous bidding regardless of the format used.

117. *Information released at the end of the allocation stage:* Revealing information about the winning bidders and the packages that they have won at the end of the allocation stage (and prior to the assignment stage), as proposed by Rogers and supported by TELUS, could lead to anti-competitive behaviour, such as predatory bidding, in the assignment stage.

Decision

118. Industry Canada will use anonymous bidding during the clock rounds. After every clock round, each bidder will be given its own bid information from the previous round and its eligibility for the next round. In addition, all bidders will be informed of the aggregate demand for each product from the previous round and the price of each product for the next round. As indicated in Section 4.1.4, information concerning the aggregate demand from the final clock round will be withheld until the end of the auction.

119. At the end of the allocation stage, after the results have been verified by a third party, bidders will be informed of their own winning packages, along with the base price to be paid for their winning package.

120. Following the end of each assignment round, after the results have been verified by a third party, participating bidders will be notified of the specific licences that they have won and the assignment price to be paid.

121. At the end of the assignment stage, winning bidders will be notified of the specific licences that they have won and the final prices to be paid (the sum of the base price and the assignment price(s)).

4.1.8 Public Information Disclosure

122. Industry Canada proposed that information on the aggregate demand for each product and the price for each product be made available on its website at the end of each clock round. It was also proposed that the identities of the winning bidders, their winning packages and the prices to be paid, along with all bidding information, be published following the conclusion of the auction.

Summary of Comments

123. No comments were received on the proposal to publish information on the prices and aggregate demand in each clock round on Industry Canada's Spectrum Management and Telecommunications website.

124. Rogers, Sogetel, TELUS, Bell and MTS Allstream support full disclosure of all bids following the auction.

125. Public Mobile submitted that it is concerned that full disclosure could reveal commercially sensitive information, particularly in light of the upcoming 2500 MHz auction. Quebecor, in its reply comments, suggested that Industry Canada devise a better post-auction information disclosure plan to ensure that bidders' strategic information is protected.

Discussion

126. Given the use of anonymous bidding, information will not be released while the auction is under way.

127. While the publication of the results and of all bidding information at the end of the auction could result in disclosure of information that some companies may consider commercially sensitive, this concern is outweighed by the public interest. Full disclosure allows all interested parties to verify and replicate the results of the auction, facilitating greater transparency of the auction results.

Decision

128. Industry Canada will make the following information publicly available after the conclusion of the auction:

- **the list of winning bidders, licences won and prices to be paid;**
- **the bids submitted by each bidder in every clock round, including their identity;**
- **the supplementary bids submitted by each bidder, including their identity; and**
- **the assignment bids submitted by each bidder, including their identity.**

4.1.9 Bid Increments

129. In the consultation document, Industry Canada indicated that it will use activity-based bid increments, where the increment for each product will be based on the level of excess demand for the product during the previous round.

Summary of Comments

130. MTS Allstream submitted that it agrees that the magnitude of bid increments should decline in later rounds as the level of excess demand decreases.

131. Tbaytel requested that a "clear model be developed and provided in which the methodology for tying bid value (on an incremental basis) is fully defined."

132. SaskTel proposed the use of staged bid increments, whereby larger bid increments would be used in the early rounds of the auction and in further rounds, as demand begins to drop, the increments could be decreased. Bell did not agree with this proposal.

133. Rogers submitted that Industry Canada should specify the exact formulas that will be used to calculate the bid increments on each product in advance of the auction. It also proposed that bid increments be set within a specific range of 5-10% and that all increments be capped at \$10 million. TELUS supported this proposal in its reply comments. Bell did not agree with this proposal.

Discussion

134. Bid increments are established so that the auction progresses in a timely manner. With activity-based bid increments, products that generate greater excess demand are subject to a larger bid increment than products that generate less excess demand. Bid increments increase more quickly for products with higher demand, potentially shortening the length of the auction, and will generally decline over the course of the clock rounds as demand for the licences approaches available supply.

Decision

135. The bid increments for the 700 MHz auction will be in the range of 1-20% of prices from the previous round and will be based on the level of excess demand for each product (rounded to the nearest thousand). Further information on the calculation of bid increments will be published in the information package provided to qualified bidders.

4.1.10 Number of Supplementary Bids

136. Industry Canada proposed that a bidder can submit supplementary bids for up to 500 different packages.

Summary of Comments

137. In its comments, Rogers proposed increasing the number of supplementary bids from 500 to 2,000. Bell and MTS Allstream disagreed with Rogers' proposal, whereas TELUS and Public Mobile generally supported Rogers' proposal.

Discussion

138. The limit on the number of bids in the supplementary round is a software limitation. Depending on the number of qualified bidders, it may be possible to increase the number of different packages for which a bidder will be allowed to place supplementary bids.

Decision

139. The limit on the number of different packages for which a bidder will be allowed to place supplementary bids will be announced after the bidder qualification has occurred but will be no lower than 500 different packages.

4.2 Opening Bids

140. Industry Canada sought comments on the proposed opening bids, which are the prices for the spectrum licences at the start of the auction, and the minimum that will be accepted for each licence. The proposed 700 MHz opening bid prices took into account the results of past Canadian auctions, reflecting the relative value of the licences in the different service areas. As a minimum acceptable price, the existing Cellular and PCS annual fee, adjusted to account for a licence term of 20 years using a 14% discount rate¹⁰ was used. The proposed opening bid prices were rounded to the nearest thousand dollars.

141. With respect to the paired spectrum, proposed opening bids for nine of the 14 service areas were based on the minimum acceptable price level. Three of the remaining five service areas (Eastern Ontario and Outaouais, Alberta and British Columbia) were 1.2 times this price level, whereas the two remaining service areas (Southern Ontario and Southern Quebec) were 2.6 times the minimum price level.

142. Given the current uncertainty with respect to the use and technology associated with the unpaired blocks D and E, their opening bid prices were also based on the minimum acceptable price.

Summary of Comments

143. Bell, SaskTel and WIND supported the proposed opening bids.

144. Some respondents stated that the proposed opening bids were too high, which could act as a barrier to participation in the auction and/or deployment of the spectrum, and that they should be lowered either in all areas (Public Mobile, Quebecor) or in certain service areas (Eastlink, SSI and Sogetel) and provided suggestions in this regard.

145. Rogers suggested that the opening bid prices for the paired licences in Southern Ontario and Southern Quebec, especially for block A, be lowered to \$0.327/MHz/pop. It expressed concern that the relative difference between the opening bid prices for these service areas and others was too high and that this could negatively affect bidding and price determination where opening bid prices could play a role. This concern was supported by TELUS in its reply comments.

146. TELUS suggested that the proposed opening bids be used as reserve prices with separate lower opening bids to allow for price discovery.

Discussion

147. The proposed opening bid prices reflect a conservative estimate of the market value of the spectrum licences in each service area, i.e. high enough so that Canadians receive a fair return for the use of the spectrum, but at a level that does not discourage participation in the auction.

148. In determining the proposed opening bid prices, results of past Canadian PCS and AWS auctions, as well as the current annual fee for Cellular and PCS licences, were taken into consideration. The minimum opening bid prices are based on the current annual fee for Cellular and PCS licences. This fee

¹⁰ To determine the discount rate, Industry Canada considered the pre-tax nominal discount rates used by industry, which are available at www.crtc.gc.ca.

has been in place since 2004 and is a fee that national operators, large regional operators and smaller operators are paying today in all regions of the country, demonstrating that the 700 MHz licences are likely worth at least this value.

149. *General recommendations for lower opening bids:* For the majority of the licences, the proposed opening bid prices reflect the annual Cellular and PCS fee that is currently being paid for similar licences, including those in low population areas. Given that 700 MHz spectrum is considered at least as valuable as Cellular spectrum, this suggests that the proposed minimum acceptable price level for the 700 MHz auction is set conservatively. The values of blocks A, D and E are less certain than those of the other blocks. However, recent developments in the United States suggest that there will be opportunities where this spectrum will be suitable for mobile use, with block A providing opportunities comparable to blocks B and C, and blocks D and E being used in conjunction with other bands to provide supplementary downlink use.

150. *Lower opening bids for Southern Ontario and Southern Quebec:* The proposed opening bids reflect a conservative estimate of the market value of the spectrum. Lowering the opening bid prices for Southern Ontario and Southern Quebec as suggested would imply that the expected market values of spectrum in these two service areas are comparable to those in the Eastern Ontario and Outaouais, Alberta and British Columbia service areas, as the proposed opening bid for these service areas is \$0.327/MHz/pop. However, the results from the AWS and PCS auctions suggest that the market value of spectrum in Southern Ontario and Southern Quebec is higher than elsewhere.

151. *Decoupling reserve prices from opening bid prices and lowering opening bids:* Setting separate reserve prices and lower opening bids could allow for additional price discovery. However, the proposed opening bid prices have been established conservatively and there is already an indication of the value of 700 MHz spectrum, as it has been deployed in the United States since 2007. Consequently, bidders will not be discouraged from participating in the auction or from bidding for particular licences and there remains opportunity for price discovery in the auction.

Decision

152. **Having considered the comments received, Industry Canada has decided that the opening bid prices should be as proposed, with minor changes to reflect the decision to align the tier area boundary with the Alberta/Saskatchewan provincial border in Lloydminster. The opening bids for the 700 MHz auction are listed in Table 3. The total amount of the opening bids for all spectrum blocks is \$897,294,000.**

Table 3 – Opening Bid Prices

Service Area #	Service Area Name	700 MHz Opening Bids			
		Paired Blocks A, B, C, C1 and C2		Unpaired Blocks D and E	
		\$/MHz/pop	Opening bid (\$)	\$/MHz/pop	Opening bid (\$)
2-01	Newfoundland and Labrador	0.265	\$1,364,000	0.265	\$682,000
2-02	Nova Scotia and P.E.I.	0.265	2,814,000	0.265	1,407,000
2-03	New Brunswick	0.265	1,987,000	0.265	994,000
2-04	Eastern Quebec	0.265	4,421,000	0.265	2,211,000
2-05	Southern Quebec	0.687	39,042,000	0.265	7,530,000
2-06	Eastern Ontario and Outaouais	0.327	7,677,000	0.265	3,111,000
2-07	Northern Quebec	0.265	505,000	0.265	253,000
2-08	Southern Ontario	0.687	69,324,000	0.265	13,370,000
2-09	Northern Ontario	0.265	2,053,000	0.265	1,027,000
2-10	Manitoba	0.265	3,198,000	0.265	1,599,000
*2-11	Saskatchewan	0.265	2,755,000	0.265	1,377,000
*2-12	Alberta	0.327	11,904,000	0.265	4,824,000
2-13	British Columbia	0.327	14,388,000	0.265	5,830,000
2-14	Yukon, NWT and Nunavut	0.265	284,000	0.265	142,000
	Total per block		\$161,716,000		\$44,357,000
	Total all blocks				\$897,294,000

Note: Opening bids have been calculated based on paired blocks of 5+5 MHz and unpaired blocks of 5 MHz, irrespective of whether the paired block size is 5+5 MHz or 6+6 MHz, or that the unpaired block size is 6 MHz.

*The calculation of opening bids for service areas 2-11 (Saskatchewan) and 2-12 (Alberta) reflect the decision to align the tier area boundary with the Alberta/Saskatchewan provincial border in Lloydminster.

4.3 Eligibility Points

153. Each licence has been assigned a specific number of eligibility points. These points are used in the determination of the pre-auction financial deposits and in the activity rules during the auction, influencing the bids that bidders can submit (refer to Section 4.1.3 *Activity Rule – Clock Rounds* and Section 4.1.4 *Activity Rule – Supplementary Round*). A bidder's initial eligibility is based on its pre-auction financial deposit and defines the upper limit of licences for which the bidder can bid. Subsequent eligibility points are based on bids placed in prior clock rounds.

154. Industry Canada sought comments on its proposed eligibility points for the 700 MHz auction licences, which were based on the population per service area, bandwidth per block and the relative value of the spectrum.

155. It was proposed that one eligibility point be assigned for each 5 MHz of spectrum per 100,000 in population count in a service area, rounded to the nearest 100,000 population, for the majority of service areas.¹¹ The five service areas of Southern Quebec, Eastern Ontario and Outaouais, Southern Ontario, Alberta and British Columbia were the exception. For these five service areas, the eligibility points per paired spectrum block were adjusted to reflect the relative value of the spectrum, as expressed in the opening bids.

Summary of Comments

156. Eastlink and Rogers indicated that eligibility points should be adjusted to reflect changes that they proposed to the opening bid prices.

157. Bell suggested reducing eligibility points for block A to the same level as blocks D and E, to reflect the difference between its value and that of other paired spectrum blocks.

158. Public Mobile proposed that Industry Canada assign eligibility points to service areas based on population groupings of the service areas, and added that removing the differentiation between regions would simplify eligibility points and improve flexibility.

159. Rogers and TELUS suggested simplifying the eligibility points by applying a ratio of 2:1 for paired and unpaired blocks so that bidders can easily switch between one paired and two unpaired blocks in every service area.

Discussion

160. The proposed opening bid prices for the 700 MHz auction are based on an estimated market value for the spectrum. Giving consideration to the relative value of the spectrum in the determination of the eligibility points supports substitution between licences that are similar in value and enhances price discovery. The proposed eligibility points reflect this approach and take into consideration the population per service area, bandwidth per block and the relative value of the spectrum, as expressed in the opening bids.

161. *Lower eligibility points for block A:* Although there are currently some uncertainties with regard to the ecosystem support for block A and the extent of interference with channel 51 as indicated by Bell, developments in the United States suggest that block A will provide opportunities comparable to blocks B and C. It is therefore desirable to maintain eligibility points for block A relative to the opening bids in order to facilitate substitution between block A and other paired blocks.

162. *Assigning eligibility points based on population groupings:* The value of spectrum is not equal in all areas and removing the relative values from the proposed eligibility points could undermine substitution and price discovery, potentially resulting in a less efficient outcome.

¹¹ Population based on Statistics Canada 2011 Census information, adjusted to reflect the tier structure (<http://spectrumgeo.ic.gc.ca/txt/download-eng.html>).

163. *Adjusting the ratio of eligibility points between paired and unpaired blocks:* Simplifying the eligibility points to a 2:1 ratio for paired and unpaired blocks as proposed by Rogers and TELUS would fail to recognize the higher expected value for paired blocks in Southern Quebec, Southern Ontario, Eastern Ontario and the Outaouais, Alberta and British Columbia as indicated in past auctions. However, where the price levels are the same, a 2:1 ratio for the paired and unpaired blocks does have merit, as it would permit bidders to switch easily between one paired block and two unpaired blocks.

Decision

164. **Industry Canada has modified the proposed eligibility points to a 2:1 ratio for paired and unpaired blocks in certain areas. The eligibility points associated with licences in the 700 MHz band will therefore apply as listed in Table 4 below.**

165. **The equivalent of a national licence includes 14 service areas that cover the country. There are 1,221 eligibility points associated with the equivalent of a national licence for one block of paired spectrum. There are 334 eligibility points associated with the equivalent of a national licence for one block of unpaired spectrum. Refer to Section 7.3 – *Pre-auction Financial Deposits* for details on the pre-auction financial deposit related to eligibility points.**

Table 4 – Eligibility Points

Service Area #	Service Area Name	Population*	Eligibility Points per Paired Blocks (A, B, C, C1 and C2)	Eligibility Points per Unpaired Blocks (D and E)
2-01	Newfoundland and Labrador	514,641	10	5
2-02	Nova Scotia and P.E.I.	1,061,846	22	11
2-03	New Brunswick	749,942	14	7
2-04	Eastern Quebec	1,668,394	34	17
2-05	Southern Quebec	5,683,036	296	57
2-06	Eastern Ontario and Outaouais	2,347,808	57	23
2-07	Northern Quebec	190,605	4	2
2-08	Southern Ontario	10,090,766	524	101
2-09	Northern Ontario	774,775	16	8
2-10	Manitoba	1,206,968	24	12
*2-11	Saskatchewan	1,039,584	20	10
*2-12	Alberta	3,640,395	89	36
2-13	British Columbia	4,399,939	109	44
2-14	Yukon, NWT and Nunavut	107,215	2	1
Total		33,475,914	1,221	334

Note: Population based on Statistics Canada 2011 Census information, adjusted to reflect the tier structure (<http://spectrumgeo.ic.gc.ca/txt/download-eng.html>).

*Population for service areas 2-11 (Saskatchewan) and 2-12 (Alberta) reflect the decision to align the tier area boundary with the Alberta/Saskatchewan provincial border in Lloydminster.

Note: Eligibility points have been calculated based on paired blocks of 5+5 MHz and unpaired blocks of 5 MHz, irrespective of whether the paired block size is 5+5 MHz or 6+6 MHz, or that the unpaired block size is of 6 MHz.

5. Bidder Participation — Affiliated and Associated Entities

5.1 Affiliated Entities

166. In its consultation, Industry Canada proposed that the definition of affiliated entities remain essentially as it was for the AWS auction.

Summary of Comments

167. None of the respondents to this issue suggested changes to this condition of licence.

Discussion

168. Upon review of the proposed wording, Industry Canada noted that changes could be made to clarify the definition without changing the substance. Specifically, reference to a “person” could be removed and the remaining text simplified.

Decision

169. Based on the above, the definition of affiliated entities will be modified as follows:

An entity will be deemed to be affiliated with a bidder if it controls the bidder, is controlled by the bidder, or is controlled by any other entity that controls the bidder. “Control” means the ongoing power or ability, whether exercised or not, to determine or decide the strategic decision-making activities of an entity, or to manage or run its day-to-day operations.

170. The participation rules with regard to affiliated entities will remain unchanged. Therefore, only one member of an affiliate relationship will be permitted to become a qualified bidder in the auction or the affiliated entities may apply to participate jointly as a single bidder. Affiliated entities must decide prior to the application deadline which entity will apply to participate in the auction. All affiliations must be disclosed at the time of the application.

5.1.1 Presumption of Affiliate Status

171. If a person owns, directly or indirectly, at least 20% of the entity’s voting shares (or where the entity is not a corporation, at least 20% of the beneficial ownership in such entity), Industry Canada will generally presume that the person can exercise a degree of control over the entity to establish a relation of affiliation. The ability to exercise control may also be demonstrated by other evidence. Under this rule, Industry Canada may, at any time, ask a prospective bidder for information in order to satisfy any question of affiliation.

172. **Should the entities fail to provide the relevant information in a timely fashion to allow Industry Canada to complete its determination, the Department may make a ruling on eligibility, based on the above, that the entities in question are affiliated.**

5.2 Associated Entities

173. In support of the stated policy objectives of competition, investment and timely deployment to rural areas, Industry Canada recognized that changes to the existing rules should be considered and proposed changes to the definition and treatment of associated entities in its consultation. The spectrum and network efficiencies that can be achieved through various forms of associations and arrangements may help to address the current scarcity of spectrum in the 700 MHz band, the high demand for capacity by customers and the high cost of network deployment, particularly in rural areas.

5.2.1 Definition of Associated Entities

174. Comments were sought on the following proposed definition of associated entities:

Any entities that enter into any partnerships, joint ventures, agreements to merge, consortia or any arrangements, agreements or understandings of any kind, either explicit or implicit, relating to the acquisition or use of any spectrum in the 700 MHz band will be treated as Associated Entities. Typical roaming and tower sharing agreements would not cause entities to be deemed associated.

Summary of Comments

175. Many respondents, including Bell, MTS Allstream, SaskTel, Sogetel, TELUS and WIND generally supported the proposed definition, with some requesting clarification on the scope.

176. Bell proposed that only relationships that are legally binding and would give rise to legal redress in the event of a breach be considered as associated. The BCBA suggested that the definition be limited to those engaged in consortia or partnership arrangements that include spectrum sharing to permit broadband services.

177. SSi and Mobilicity raised concerns regarding the clarity of the definition of roaming.

Discussion

178. The suggestion by Bell to only include legally binding agreements could simplify and clarify the process, but is not considered adequate, as agreements could be clearly set out, lacking only the final, legally binding signatures. Therefore, informal agreements, whether verbal or in writing, should also be captured by the definition.

179. In response to comments regarding the types of arrangements that should be included or disclosed, Industry Canada confirms that under the proposed definition, entities are only deemed to be associated with respect to arrangements that relate to the acquisition or use of spectrum in the 700 MHz band. For example, significant joint equipment purchase agreements and joint backhaul networks would not be captured under the definition unless they relate to the 700 MHz spectrum.

180. *Typical roaming agreements*: In response to other clarification questions on what constitutes a typical roaming agreement, Industry Canada notes that roaming services can be provided through a variety of technical and contractual arrangements between the carriers of the home and the host networks. Before a subscriber can complete a call or data session, the subscriber must be authenticated. Under a typical roaming agreement, the host network identifies the subscriber's home network by means of the subscriber's mobile identity credentials, verifies that a roaming agreement exists with that carrier, and queries the home network to verify that the subscriber's account is current (in some instances, to also obtain information about the subscriber, such as preferred service features). On the other hand, agreements with respect to more integrated networks (for example, where such subscriber authentication, and even the service provision, can be done directly from the core elements of the home network, such as a Multi-Operator Core Network (MOCN)) would not be considered a typical roaming agreement. Bidders that enter into such an agreement with respect to use of the 700 MHz spectrum would therefore be captured under the definition of associated entities.

Decision

181. In consideration of the above, associated entities will be defined as proposed:

Any entities that enter into any partnerships, joint ventures, agreements to merge, consortia or any arrangements, agreements or understandings of any kind, either explicit or implicit, relating to the acquisition or use of any spectrum in the 700 MHz band will be treated as Associated Entities. Typical roaming and tower sharing agreements would not cause entities to be deemed associated.

5.2.2 Eligibility to Participate Separately in the Auction

182. Given the above definition, Industry Canada proposed that depending on the nature of the association, associated entities could be permitted to apply to Industry Canada to participate in the auction separately. Along with their application, applicants would be required to submit a narrative description of the nature of the association, which would be assessed to determine whether permitting both entities to participate separately would negatively affect the integrity of the auction process.

Summary of Comments

183. Many respondents, including Bell, Quebecor, Sogetel, TELUS, WIND, SaskTel and Xplornet, generally supported the proposal that associated entities be permitted to bid separately with some suggested modifications or clarifications.

184. Cogeco, Eastlink, Mobilicity, PIAC, Public Mobile and Rogers did not support associated entities bidding separately. Cogeco and Public Mobile expressed concerns with regard to the impact of this proposal on competition and choice. Rogers also raised concerns that the proposed changes could allow a level of cooperation by bidders having in-depth knowledge of their combined spectrum needs, which could threaten the integrity of the auction.

185. Quebecor asked Industry Canada to clarify that the rules accommodate, in a non-discriminatory manner, potential associations that could be formed between national carriers, between regional carriers, and between national and regional carriers.

Discussion

186. In previous auctions, parties that were deemed to be affiliated or associated entities as a result of arrangements relating to the spectrum being auctioned were only permitted to participate in the auction as a single bidder. The intent of this restriction was to preclude a real or perceived cooperation between bidders which may not compete in the auction process and may have an advantage over other participants. In the consultation, Industry Canada proposed that associated entities could participate in the auction separately, as long as this would not have an adverse impact on the integrity of the auction.

187. In response to concerns regarding competition and choice, Industry Canada is aware that, in some cases, carriers have entered into spectrum sharing arrangements for technical and business reasons.

188. In response to Quebecor's request for clarification that the rules apply in a non-discriminatory manner, it should be noted that the proposed rules allowed regional carriers, which are associated with carriers that plan to operate in different licence areas, to apply to participate in the auction separately without having to request that the aggregation limits apply separately as long as they comply with the anti-collusion rules. Furthermore, the proposed rules would also allow carriers to form a bidding consortium and participate in the auction as a single bidder if they wish to coordinate their bids. In such a case, the aggregation limits would apply jointly in each licence area.

189. It is Industry Canada's view that real or perceived cooperation between associated entities prior to and during the auction could put auction integrity at risk. As a result, Industry Canada will permit separate participation by associated entities, but will preclude actions that could provide an unfair advantage through rules that prohibit collusion (i.e. discussions prior to and during the auction will be highly restricted). All auction participants must comply with the information disclosure rules and the anti-collusion rules set out in this Framework. It should be noted that the rules regarding prohibition of collusion, as set out in Section 5.4, differ from the rules proposed in the consultation and are more consistent with the collusion rules applied in previous auctions. These rules, together with the anonymous bidding rule outlined in Section 4 of this Framework, will serve to support and maintain auction integrity.

Decision

190. Based on the above considerations, Industry Canada is of the view that allowing associated entities to bid separately would not have an adverse impact on the integrity of the auction provided that auction participants comply with the information disclosure and anti-collusion rules as set out below (Section 5.3 – *Auction Integrity and Transparency* and Section 5.4 – *Prohibition of Collusion*). Associated entities may apply to participate in the 700 MHz auction separately. Industry Canada will review the applications and narratives, including responses to potential requests for additional information, in order to ensure that the published narratives provide the appropriate level of disclosure and transparency to all bidders.

5.2.3 Eligibility to have the spectrum aggregation limits apply separately

191. Industry Canada also proposed that associated entities could request that the spectrum aggregation limits apply individually as long as parties intend to compete separately in the applicable licence area(s) and continue to function as competitors to a level satisfactory to Industry Canada. Proposed assessment criteria included “the degree to which the entities would offer branded services, pricing and device selection that are unique.” Comments were sought on the proposed approach and assessment criteria.

192. The consultation also provided details on the application of the spectrum aggregation limit for associated entities. The condition of licence on “Spectrum Aggregation Limits” stated that:

Where licensees establish an agreement to share spectrum such that another entity has control over the use of the spectrum, a subordinate licence is required. This requirement applies to all spectrum sharing arrangements, whether the arrangement is established post-auction or was established and disclosed prior to the auction. Subordinate licences may not count towards the licensee’s aggregation limit if the licensees demonstrate to the satisfaction of Industry Canada that they meet the criteria with respect to competing in the applicable service area.

Summary of Comments

193. *Individual aggregation limits:* Bell, TELUS, SaskTel and WIND largely favoured allowing spectrum sharing agreements with the aggregation limits being applied individually and the proposed assessment criteria.

194. Rogers, MTS Allstream, Eastlink, Mobilicity and Public Mobile opposed the policy change, citing concerns about spectrum aggregation and its impacts on downstream competition. Some respondents suggested alternatives. For example, Rogers suggested a cap of two prime blocks for spectrum sharers, a suggestion supported by MTS Allstream. Xplornet also proposed various aggregation limits for incumbents and non-incumbents, depending on the spectrum blocks.

195. Rogers raised some concerns that the proposed policy would negatively affect some entities with inter-carrier relationships in a small subset of a licence area.

196. *Criteria to consider in determining whether entities are competing:* Bell and WIND agreed with the proposed criteria. Eastlink, Mobilicity, Public Mobile, Rogers and SaskTel considered the criteria to be vague or insufficient.

Discussion

197. One of the major concerns identified was the potential that companies attempt to use spectrum sharing agreements in such a manner that would reduce overall competition in the marketplace.

198. Currently, spectrum sharing arrangements are permitted in any spectrum band, as long as the licensees, individually and jointly, continue to comply with the rules that are in place, including any relevant spectrum aggregation limits and set-asides.

199. Spectrum sharing arrangements support network and spectrum efficiencies, potentially resulting in better network speeds and coverage for Canadians. This is particularly important in the 700 MHz band, where a limited amount of spectrum is available.

200. However, one concern with respect to spectrum sharing is that it could result in associated entities not providing wireless services separately and actively. In order to address this risk, Industry Canada proposed in its consultation that should associated entities wish to have the spectrum aggregation limits apply separately, they must submit details of their arrangements for review and decision by Industry Canada.

201. Another concern is that spectrum sharing agreements could have negative implications for competition in the overall market. Under the *Competition Act*, the Competition Bureau may review any agreements between competitors that could result in preventing or lessening competition substantially in a market.

Decision

202. Based on the above considerations, associated entities participating in this licensing process are permitted to request that the spectrum aggregation limits apply individually prior to or post-auction. To obtain approval, entities will be required to demonstrate to Industry Canada's satisfaction that they intend to separately and actively provide services in the applicable licence area, for at least the duration of the spectrum aggregation limits.

203. Where licensees establish an agreement to share spectrum such that another entity has control over the use of the spectrum, as defined in Section 6.2 – *Spectrum Aggregation Limits* and Section 6.3 – *Licence Transferability, Divisibility and Subordinate Licensing* of this Framework, Industry Canada will conduct reviews to determine if the associated entities intend to, and continue to, make use of the 700 MHz spectrum to actively and independently provide services in the applicable licence area. The onus will be on the associated entities to demonstrate to Industry Canada that this is the case.

204. Industry Canada's review will not extend to an overall assessment of the effects of the agreement between associated entities on competition in the marketplace.

205. *Assessment factors*: Industry Canada will consider a broad range of criteria so as to determine the associated entities' intent and actions to actively and independently provide wireless services. Assessment criteria may include, but will not be limited to:

- the companies' intent and actions to provide services (coverage) in the area in which the sharing occurs;
- the level of investment, including in distribution, marketing and customer service, in order to acquire and serve customers; and
- the companies' demonstration of separate presences in the marketplace.

206. *Documentation*: Associated entities will be invited to provide all relevant documentation to Industry Canada in regard to the above-noted assessment factors. These may include, but will not be limited to:

- all agreements relating to the transfer of, use of and access to the 700 MHz spectrum;
- business plans for the area in which the agreement(s) will provide access to spectrum; and
- business and financial results, including investments and customer acquisition.

207. Industry Canada may request additional documentation to complete its assessment and may require that documents be certified by an officer of the company.

208. For additional information on the application of the spectrum aggregation limits for associated entities, refer to the condition of licence entitled “Spectrum Aggregation Limits” in Section 6.2 of this document. It should be noted that agreements between associated entities may have an impact on obligations to serve rural areas (see Section 6.12 – *Rural Deployment Requirements*).

209. Industry Canada notes that requests to have the spectrum aggregation limits apply separately may be submitted at any time up to and including the final application deadline (refer to Section 7.2 – *Submissions*). However, parties may approach Industry Canada at any time for guidance or a determination as to how their arrangement or proposed arrangement would create an association under these rules.

210. Regardless of any approval by Industry Canada, associated entities are reminded that the provisions of the *Competition Act* apply independently of, and in addition to, the policy.

5.3 Auction Integrity and Transparency (Information disclosure pre-auction)

211. In order to maintain the integrity of the auction while allowing associated entities to bid separately, the consultation proposed that, prior to the auction, bidders would be required to disclose all associations with other bidders through a narrative describing the key elements and the nature of their association. The submitted narrative would be made available to other bidders and to the public on Industry Canada’s Spectrum Management and Telecommunications website at <http://www.ic.gc.ca/spectrum>, prior to the auction. It was also proposed that communications between associated bidders not be permitted during the auction process.

Summary of Comments

212. Many respondents, including Bell, WIND, SaskTel, Xplornet and MTS Allstream, expressed concerns about the proposed public disclosure of information regarding the nature of the associations. Concerns included the potential negative impacts on companies’ strategies and potential influence on competitors’ bidding behaviour in the event that commercially sensitive information was disclosed.

213. Mobilicity and Tbaytel suggested that the documentation regarding associations be subject to a public comment process.

Discussion

214. Transparency is critical in order to ensure auction integrity. The availability of information related to the associations will provide other bidders with the opportunity to assess the level of competition to be expected during the auction, the potential post-auction scenarios, thus increasing their ability to assess the value of the spectrum and to develop bidding strategies.

215. Industry Canada considers that, in this instance, it is necessary to disclose information on the nature of the association in order to preserve auction integrity. However, the need to protect commercially sensitive information is also recognized. In order to balance these two considerations, only the narrative will be released publicly and a public comment process will not be undertaken. Associated entities may participate in the auction separately if they submit a narrative to Industry Canada and the Department determines that it provides sufficient information for other bidders to understand the nature of the relationship, for public release. For example, the narrative must disclose the parties to the arrangement, whether discussions are preliminary or whether a formal agreement is in place and the subject of the arrangement (joint backhaul network, etc.)

Decision

216. Based on the above considerations, associated entities wishing to participate in the 700 MHz auction separately are required to disclose the names of associated entities within their application, and to provide a narrative describing all key elements and the nature of the association in relation to the acquisition of the spectrum licences being auctioned and the post-auction relationships of the said entities. Companies may be asked to provide copies of related agreements. Confidential and commercially sensitive information regarding agreements between associated entities will not be disclosed by Industry Canada. However, the narrative will be made available on Industry Canada’s website prior to the auction.

5.4 Prohibition of Collusion

217. In the consultation, Industry Canada sought comments on the rules regarding prohibition of collusion as follows:

From the date of application until the deadline for the final payment on winning bids, each applicant is prohibited from cooperating, collaborating, discussing, negotiating or entering into agreements, arrangements or understandings with any competitors regarding the licences being auctioned, bids or bidding strategies in the auction, or the post-auction market structure. Each applicant is also prohibited from signalling its bidding intentions, either publicly or privately, from the application deadline until the end of the bidding process.

The application form to participate in the auction will include a declaration that the applicant will be required to sign certifying that the applicant has not entered into any agreements, arrangements or understandings of any kind with any competitor, other than those disclosed to Industry Canada, regarding the spectrum licences being auctioned or the post-auction market structure. The applicant must also certify that it will not discuss during the auction, any

agreements, arrangements or understandings of any kind with any competitor, including its disclosed associated entities, regarding the spectrum licences being auctioned or the post-auction market structure. For the purposes of this certification, “competitor” means any entity, other than the applicant and/or its affiliates, which could potentially be a bidder in this auction based on its qualifications, abilities or experience.

Should a bidder fail to comply with this prohibition, it may be subject to disqualification from the auction and/or forfeiture penalties.

Summary of Comments

218. Rogers expressed concern that the proposal would allow sharing of bidding strategies in advance of the auction, which would be as damaging as if bidders were allowed to cooperate during the auction. Rogers also suggested that the proposed changes could provide bidders with in-depth knowledge of their combined spectrum needs, which could threaten the integrity of the auction. MTS Allstream and Xplornet noted the need to establish collusion rules leading up to and during the auction to prevent any sharing of information or bidding strategy.

219. Other respondents, including Bell, Mobilicity, Drs. Taylor and Middleton from Ryerson University, SSI, Sogetel, TELUS and WIND, expressed support for the option proposed in the consultation paper.

220. Conversely, Quebecor would like associated entities to be permitted to discuss bidding strategies prior to and during the auction in order to realize the full benefits of the association.

Discussion

221. Anti-collusion rules prohibit communications between bidders in order to prevent an unfair advantage for one or more bidders as a result of information sharing.

222. Under the proposal, associated bidders would have been able to share bidding strategies prior to the application date. Stakeholders suggested that this could provide a significant information and valuation advantage over other bidders.

223. Based on the above concerns, Industry Canada has determined that such an advantage could threaten the integrity of the auction. As a result, communications will be more restricted than proposed. Under the anti-collusion rules, any discussion between separate bidders prior to the auction that would provide insights into bidding strategies, including reference to preferred blocks, technologies or valuations, will be precluded. Conversely, two or more carriers forming a bidding consortium and participating in the auction as a single bidder would not be precluded from such discussions.

224. Although restricting discussions both prior to and during the auction process means that bidders would lose the full advantage of forming associations prior to the auction, it is necessary in order to maintain auction integrity. Furthermore, bidders can avail themselves of the full advantage of forming associations after the auction.

Decision

225. In consideration of the above, the rules on prohibition of collusion will apply as follows:

All applicants, including affiliated and associated entities, are prohibited from cooperating, collaborating, discussing or negotiating agreements with competitors, relating to the licences being auctioned or relating to the post-auction market structure, including frequency selection, bidding strategy and post-auction market strategy, until the deadline for the final payment.

Prospective bidders will note that the auction application forms contain a declaration that the applicant will be required to sign certifying that the applicant has not entered into and will not enter into any agreements or arrangements of any kind with any competitor regarding the amount to be bid, bidding strategies or the particular licence(s) on which the applicant or competitors will or will not bid. For the purposes of this certification, “competitor” means any entity, other than the applicant or its affiliates, which could potentially be a bidder in this auction based on its qualifications, abilities or experience.

Prospective bidders should note that the definition of “affiliate” for the purposes of this licensing process (defined by reference to “control in fact”) differs from “affiliate” for the purposes of the *Competition Act*. The provisions of the *Competition Act* apply independently of, and in addition to, the policies contained in this Framework.

5.4.1 Communication During the Auction Process

226. In order to preserve the integrity of the auction process, any communications from an applicant, its affiliates, associates or beneficial owners or their representatives that discloses or comments on bidding strategies, including but not limited to the intent of bidding and post-auction market structures, shall be considered contrary to this Framework and may result in disqualification and/or forfeiture penalties. This will include communications with or via the media. This prohibition of communication applies until the deadline for the final payment on winning bids for each round.

5.4.2 Discussion Regarding Beneficial Ownership

227. Information regarding the beneficial ownership of each applicant will be made publicly available so that all bidders have knowledge of the identity of other bidders. Any discussions regarding an addition or a significant change of beneficial ownership, from the receipt deadline for applications until the deadline for the final payment on winning bids, involving two bidders or any of their affiliates or associates, would fall into the area of prohibited discussions and would be considered contrary to the auction rules.

228. However, an applicant may discuss changes in beneficial ownership with parties who are completely unrelated to other applicants, as long as:

- any change to the beneficial ownership of the applicant which provides a new party with a beneficial interest or which significantly alters the beneficial ownership structure is effected at least 10 days before the commencement of bidding; and
- the applicant informs the Minister of Industry immediately, in writing, of any change in beneficial ownership, which will be reflected in its published qualified bidder information on Industry Canada's Spectrum Management and Telecommunications website at <http://www.ic.gc.ca/spectrum>.

229. Bidders must cease all such negotiations commencing 10 days before the commencement of bidding until the deadline for the final payment.

5.4.3 Discussions on Tower Sharing

230. The prohibition of communication includes discussions about tower and site sharing with respect to the licences that are the subject of this auction, from the receipt deadline for applications until the receipt deadline for payment of winning bids. Discussions concerning new arrangements or the expansion of existing sharing arrangements that relate to spectrum outside of the 700 MHz auction process are not prohibited.

5.4.4 Communication with Local Exchange Carriers

231. The prohibition of communication includes discussions regarding interconnection services with a local exchange carrier (LEC) that is a qualified bidder (or one of its affiliates/associates) in this auction, where the services relate to spectrum in the 700 MHz band.

5.4.5 Consulting Services, Legal and Regulatory Advice

232. Separate bidders may not receive consulting advice from the same auction consulting company. Separate bidders may receive legal and regulatory advice from the same law firm provided that the law firm complies with the conflict of interest and confidential information requirements of the applicable law society and that the applicants otherwise comply with the provisions set forth in this document.

6. Conditions of Licence for Spectrum in the 700 MHz Band

233. The following conditions will apply to all licences issued through the auction process for spectrum in the 700 MHz band. It should be noted that the licences are subject to the relevant provisions in the *Radiocommunication Act* and the *Radiocommunication Regulations*, as amended from time to time. For example, the Minister continues to have the power to amend the terms and conditions of spectrum licences (section 5(1)(b) of the *Radiocommunication Act*). The Minister may do so for reasons including furtherance of the policy objectives set out in section 7 of the *Telecommunications Act* and the policy objectives related to this band as set out in SMSE-002-12. Such action would normally only be undertaken after consultation.

234. Licensees must be fully aware of their obligations with respect to licence terms and conditions. Industry Canada will monitor compliance and take any necessary action to ensure compliance and to enforce the provisions of the *Radiocommunication Act* and the *Radiocommunication Regulations*.

6.1 Licence Term

235. Industry Canada sought comments on its proposal to issue spectrum licences in the 700 MHz band with a 20-year licence term.

Summary of Comments

236. The majority of respondents who commented on this issue supported the proposed 20-year licence term, including Bell, MTS Allstream, Mobilicity, Quebecor, Rogers, SaskTel, Sogetel, SSI, TELUS and WIND.

237. The Eastern Ontario Regional Network (EORN), the Ontario Minister of Agriculture, Food and Rural Affairs and Drs. Taylor and Middleton from Ryerson University disagreed with the proposed term. Concerns were noted that longer licence terms would not necessarily result in adequate deployment, particularly in rural areas, and that the current rate of development in wireless technology is too fast and unpredictable to commit Canadian frequencies for such an extended period of time.

Discussion

238. The revised *Framework for Spectrum Auctions in Canada*, published in March 2011, states that Industry Canada is adopting a flexible approach in determining licence terms (up to 20 years) based on the specific spectrum being offered.

239. This decision was based on the recognition that licence terms in excess of 10 years would create greater incentive for financial institutions to invest in the telecommunications industry and for the industry itself to further invest in the development of network infrastructure, technologies and innovation.

240. The 700 MHz band, which has excellent propagation characteristics, is considered to be important in the deployment of next-generation mobile broadband services in rural areas and in meeting the increasing demand and network congestion in urban areas. The issue with regard to spectrum usage is better addressed through conditions of licences which consider the deployment requirements of licensees within the term of the licence.

241. The 700 MHz spectrum has already been licensed in the United States for mobile broadband services. Although changes in technology are inevitable over time, it is unlikely that any technical developments would result in a change to another use that would be incompatible with mobile broadband within the next 20 years.

Decision

242. In light of the above, auctioned spectrum licences in the 700 MHz band will have a licence term of 20 years. The condition of licence is as follows:

The term of this licence is 20 years. At the end of this term, the licensee will have a high expectation that a new licence will be issued for a subsequent term through a renewal process 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.

The process for issuing licences after this term and any issues relating to renewal, including the terms and conditions of the new licence, will be determined by the Minister of Industry following a public consultation.

6.2 Spectrum Aggregation Limits

243. Competitive measures with regard to the 700 MHz band were announced in SMSE-002-12. Industry Canada sought comments on the proposed wording of the condition of licence related to the spectrum aggregation limits as follows:

The licensee must comply with the spectrum aggregation limits as follows:

- A limit of two paired frequency blocks in the 700 MHz band (blocks A, B, C, C1 and C2) is applicable to all licensees.*
- A spectrum cap of one paired spectrum block within blocks B, C, C1 and C2 is applicable to all large wireless service providers. Large wireless service providers are defined as companies with 10% or more of the national wireless subscriber market share, or 20% or more of the wireless subscriber market share in the province of the relevant licence area.*

The spectrum caps put in place for the 700 MHz auction will continue to be in place for five years following licence issuance. Therefore, no transfer of licences or issuance of new licences will be authorized that allows a licensee to exceed the spectrum caps during this period. Any change in ownership or control granting a right or interest to another licensee in this band may be considered as licence transfer for the purpose of this condition of licence whether or not the licensee name is changed as a result. The licensee must request approval by the Minister of Industry for any change that would have a material effect on its compliance with these spectrum aggregation limits. Such a request must be made in advance for any proposed transactions within its knowledge.

Summary of Comments

244. Mobicity, Public Mobile, Quebecor, SaskTel, Sogetel, SSI and WIND agreed with the proposed wording. TELUS proposed some minor modifications to the wording in order to improve clarity, which Bell supported. Quebecor suggested that further precision be added by explicitly stating that the reference data that will be used to determine market share will rely on the 2012 *CRTC Communications Monitoring Report*.

Discussion

245. TELUS proposed minor edits to the text, which included changing the term “caps” to “aggregation limits” and enhancing the clarity of the wording regarding any changes to the licensee’s ownership and control structure. Industry Canada agrees that the proposed changes would provide additional clarity to the condition of licence without changing its meaning. The wording of the condition was also modified to preclude any agreements that would result in the licensee having a right or interest in spectrum in excess of the spectrum aggregation limits for as long as the limits are in place.

246. Industry Canada also agrees with the suggestion by Quebecor to explicitly state that the reference data to be used in the determination of subscriber market share will rely on the 2012 *CRTC Communications Monitoring Report*.

Decision

247. Based on the considerations stated above, the wording for the condition of licence is as follows:

The licensee must comply with the spectrum aggregation limits as follows:

- **A limit of two paired spectrum blocks in the 700 MHz band within blocks A, B, C, C1 and C2 is applicable to all licensees.**
- **A limit of one paired spectrum block within blocks B, C, C1 and C2 is applicable to all licensees which are large wireless service providers. Large wireless service providers are defined as companies with 10% or more of the national wireless subscriber market share, or 20% or more of the wireless subscriber market share in the province of the relevant licence area.¹² The determination of subscriber market share will be based on the 2012 *CRTC Communications Monitoring Report*.**

These spectrum aggregation limits will continue for five years from the date of licence issuance. No transfer of licences or issuance of new licences will be authorized if it would result in a licensee exceeding the spectrum aggregation limits during this period. Any change in ownership or control of a licensee or any other agreement that has the effect of granting a right or interest in a 700 MHz licence to another licensee in this band may be considered as a licence transfer for the purpose of this condition of licence whether or not the licensee name is changed as a result. The licensee must request approval by the Minister of Industry for any change that would have a material effect on its compliance with these spectrum aggregation limits. Such a request must be made in advance for any proposed transactions within its knowledge. At any time, at the request of Industry Canada, the licensee will be required to provide updated information demonstrating ongoing compliance with this condition of licence.

¹² The subscriber market share for Ontario will apply for the licence area 2-06, Eastern Ontario and Outaouais. For the Tier 2-14 licence area (Yukon, Northwest Territories and Nunavut), only the national market share criteria will apply.

248. As noted in Section 5.2.3, associated entities requesting that the spectrum aggregation limits be applied individually rather than jointly, must demonstrate to the satisfaction of Industry Canada that they will be separately and actively providing services to customers in the applicable service area, for at least the duration of the spectrum aggregation limits.

249. Where licensees establish an agreement to share spectrum such that another entity has control over the use of the spectrum, a subordinate licence is required. This requirement applies to all spectrum sharing arrangements, whether the arrangement is established post-auction or was established and disclosed prior to the auction. Generally, a subordinate licence will count towards the spectrum aggregation limit in a service area; however, for the 700 MHz spectrum auctioned through this licensing process, subordinate licences may not count towards the licensee's aggregation limit if the licensees demonstrate to the satisfaction of Industry Canada that they meet the criteria with respect to separately and actively providing services to customers in the applicable service area as discussed in Section 6.3.

6.3 Licence Transferability, Divisibility and Subordinate Licensing

250. In general, licences obtained through an auction may be transferred in whole or in part (either in geographic area or in bandwidth) to a third party, subject to Industry Canada's approval and subject to the conditions stated on the licence and other applicable regulatory requirements.

251. In its consultation, Industry Canada proposed the following wording for the condition of licence on transferability and divisibility:

The licensee may apply, in writing, to transfer its licence in whole or in part (divisibility), in both the bandwidth and geographic dimensions in accordance with Client Procedures Circular CPC-2-1-23, Licensing Procedure for Spectrum Licences for Terrestrial Services, as amended from time to time. Licensees may apply to use a subordinate licensing process.

Industry Canada's approval is required for each proposed subordinate licence or transfer, whether the transfer is in whole or in part. Industry Canada may define a minimum bandwidth and/or geographic dimension (such as the grid cell) for the proposed transfer. The transferor(s) must provide an attestation and other supporting documentation demonstrating that all conditions, technical or otherwise, of the licence have been met. The transferee(s) must provide an attestation and other supporting documentation demonstrating that it meets the eligibility criteria, including documentation related to associates and affiliates demonstrating that the transfer is in accordance with any spectrum aggregation limits.

Subordinate licences may not count towards the licensee's aggregation limit if the subordinate licensee demonstrates to the satisfaction of Industry Canada that the relevant licensees meet the criteria with respect to competing in the post-auction market (see condition of licence regarding Spectrum Aggregation Limits).

The transferee must satisfy all applicable conditions of licence including, rural deployment and general deployment requirements.

Summary of Comments

252. Bell, Rogers, Quebecor, SSI and Sogetel generally supported the proposed wording.
253. TELUS proposed changes to the title and text of the condition of licence to provide clarity. Bell disagreed with TELUS' suggestion to change the title to include "and Subordinate Licensing." However, it supported TELUS' suggested changes to the text, as did Xplornet.
254. Mobilicity requested that rules pertaining to transfer or divisibility of the 700 MHz spectrum not impede the ability of the AWS new entrants to transfer or divide any 700 MHz spectrum at the same time as they transfer their AWS spectrum should such a transfer be part of a single transaction.
255. WIND proposed amendments to ensure that rollout conditions do not form part of the evaluation of the transfer request if the target date for the rollout has not yet arrived.
256. MTS Allstream and Mobilicity argued that subordinate licence agreements within the first five years should count towards a licensee's spectrum aggregation limits; whereas Xplornet stated that no transfer or issuance of new licences should be authorized within those five years.
257. Additional comments were received which were outside of the scope of the consultation, as they dealt with issues that extend beyond the 700 MHz band, or proposed changes to decisions already announced in SMSE-002-12.

Discussion

258. Where competitive measures have been put in place, either to limit the amount of spectrum held by a licensee (spectrum aggregation limit), or to restrict the eligibility of access to a specific spectrum band (set-aside), the ability to transfer and divide the licence in question will be similarly restricted. With respect to spectrum in the 700 MHz band, transfers are not permitted where they will result in a licensee exceeding the spectrum aggregation limit.
259. In the consultation, Industry Canada proposed changes to provide increased flexibility in the treatment of a certain subset of associated entities such that they could participate in the auction separately and have the spectrum aggregation limit apply separately, as long as this would not have an adverse impact on the integrity of the auction or the intent of the spectrum aggregation limit.
260. Industry Canada also proposed in its consultation that subordinate licences may not count towards the licensee's spectrum aggregation limit if the licensees demonstrate to the satisfaction of Industry Canada that they meet the criteria with respect to competing in the applicable service area.
261. Industry Canada considers that most of the changes proposed by TELUS would add clarity to the condition of licence. In addition, Industry Canada confirms that the deployment status would not form part of an evaluation of licence transfer if the date for the deployment requirement (rollout) has not yet arrived and a minor change has been made to clarify this point. Furthermore, the proposed rules will not impede the ability of AWS new entrants to transfer or divide any 700 MHz or AWS spectrum as part of the same transaction, unless any part of the transfer or division would be contrary to any applicable conditions of licence.

262. As noted in the consultation, where licensees establish an agreement to share spectrum such that another entity has control over the use of the spectrum, a subordinate licence is required. Generally, this applies where an entity is responsible for the operation of equipment using the spectrum. It is noted, however, that other agreements may result in an entity having decision-making power with respect to network design and operations, which would result in Industry Canada determining that the entity has control over the spectrum. In such situations, Industry Canada may determine that subordinate licences are required. Companies may approach the Department for clarity at any time prior to entering into an agreement in order to determine whether subordinate licences would be required under the particular circumstances.

263. Licensees must apply to Industry Canada for the issuance of subordinate licences prior to the implementation of any spectrum sharing agreements or any agreement that provides for another party to operate the spectrum. For further information on these requirements, refer to Client Procedures Circular CPC-2-1-23, *Licensing Procedure for Spectrum Licences for Terrestrial Services*, as amended from time to time.

264. Generally, a subordinate licence will count towards the spectrum aggregation limit in a service area in addition to licences held directly by the subordinate licensee and those held by its associates or affiliates. However, in the case of associated entities, the proposed subordinate licensee may apply to have its subordinate licence(s) excluded from the calculation of its holdings for the purposes of the spectrum aggregation limit, if the subordinate licensee can demonstrate as part of its application that it will separately and actively provide services to customers in the applicable service area.

Decision

265. In consideration of the above, the condition of licence on transferability and divisibility will apply as follows:

The licensee may apply, in writing, to transfer its licence in whole or in part (divisibility), in both the bandwidth and geographic dimensions in accordance with Client Procedures Circular CPC-2-1-23, *Licensing Procedure for Spectrum Licences for Terrestrial Services*, as amended from time to time. Industry Canada's approval is required for each proposed transfer, whether the transfer is in whole or in part. Industry Canada may define a minimum bandwidth and/or geographic dimension (such as the grid cell) for the proposed transfer.

The transferor(s) must provide an attestation and other supporting documentation demonstrating that it is in compliance with all conditions of licence, technical or otherwise. The transferee(s) must provide an attestation and other supporting documentation demonstrating that it meets the eligibility criteria, including documentation related to associates and affiliates demonstrating that the transfer is in accordance with any spectrum aggregation limits.

The licensees may also apply, in writing, to use a subordinate licensing process. Industry Canada’s approval is required for each proposed subordinate licence. Subordinate licences will not count towards the subordinate licensee’s spectrum aggregation limit if the primary licensee and the subordinate licensee demonstrate to the satisfaction of Industry Canada that they will be separately and actively providing services to customers in the applicable licence area. Where such approval is granted and for at least the duration of the aggregation limits that are in place, licensees must implement their plans to the satisfaction of Industry Canada. Any modifications to these plans must be submitted to Industry Canada for approval.

266. The criteria to be considered in determining whether the companies intend to separately and actively provide services to customers in the applicable licence area are included in Section 5.2.3 – *Eligibility to have the spectrum aggregation limits apply separately*, of this Framework. The ongoing requirement to compete for at least the duration of the spectrum aggregation limits will become a condition of licence specific to the licensees involved.

267. These requirements are subject to revision and amendment for reasons including furtherance of the policy objectives related to the 700 MHz band. Agreements regarding licence transfers are also subject to the provisions of the *Competition Act*.¹³

6.4 Eligibility

268. As stated in the consultation, generally, spectrum licences contain an eligibility condition of licence that reads as follows:

The licensee must comply on an ongoing basis with the eligibility criteria for a radiocommunication carrier, including compliance with subsection 10(2) of the Radiocommunication Regulations. The licensee must notify the Minister of Industry of any change which would have a material effect on its eligibility. Such notification must be made in advance for any proposed transaction within its knowledge. For further information, refer to Industry Canada’s Client Procedures Circular CPC-2-0-15, Canadian Ownership and Control, as amended from time to time.

Summary of Comments

269. Respondents who commented on this issue agreed with the proposed wording.

Discussion

270. On June 29, 2012, the *Telecommunications Act* was amended to lift foreign investment restrictions for telecommunications companies with annual revenues from the provision of telecommunications services in Canada that represent less than 10% of the total annual revenues from such services in

¹³ *Competition Act* (<http://laws-lois.justice.gc.ca/eng/acts/C-34/>).

Canada, as determined by the Canadian Radio-television and Telecommunications Commission (CRTC).¹⁴ The total annual revenue from the provision of telecommunications services in Canada is published annually by the CRTC in its *Communications Monitoring Report*. Industry Canada will review Client Procedures Circular CPC-2-0-15, *Canadian Ownership and Control*, to clarify the effects on spectrum licence holders operating under the *Radiocommunication Act* and *Radiocommunication Regulations*.

271. Given the changes made to the *Telecommunications Act* and to ensure consistency, minor changes were made to the wording to remove the reference to “radiocommunication carriers.”

Decision

272. In consideration of the above, and noting that the text could be further simplified with no impact on licensees, the condition of licence will be stated as follows:

The licensee must comply on an ongoing basis with the applicable eligibility criteria of the *Radiocommunication Regulations*. The licensee must notify the Minister of Industry of any change that would have a material effect on its eligibility. Such notification must be made in advance for any proposed transactions within its knowledge. Where information is required related to reviewing eligibility, licensees should refer to Client Procedures Circular CPC-2-0-15, *Canadian Ownership and Control*, as amended from time to time.

6.5 Treatment of Existing Spectrum Users

273. The decision regarding the treatment of existing spectrum users was announced and published in SMSE-002-12, *Policy and Technical Framework: Mobile Broadband Services (MBS) – 700 MHz Band, Broadband Radio Service (BRS) – 2500 MHz Band*. Industry Canada sought comments on proposed wording for the condition of licence that basically referred to this previous decision.

Summary of Comments

274. None of the respondents who commented on this issue suggested any changes to the proposed wording of this condition of licence.

Decision

275. In consideration of the above, the condition of licence will be stated as follows:

The licensee must comply with the displacement policies set out in SMSE-002-12, *Policy and Technical Framework: Mobile Broadband Services (MBS) – 700 MHz Band, Broadband Radio Service (BRS) – 2500 MHz Band*.

¹⁴ See paragraph 16(2)(c) and subsections 16(6) and 16(7) of the *Telecommunications Act*.

6.6 Radio Station Installations

276. Industry Canada sought comments on the proposed wording for the condition of licence related to radio station installations.

Summary of Comments

277. All respondents who commented on this issue agreed with the proposed wording for the condition of licence.

Decision

278. In accordance with the above, the condition of licence will be stated as follows:

The licensee must comply with Client Procedures Circular CPC-2-0-03, *Radiocommunication and Broadcasting Antenna Systems*, as amended from time to time.

6.7 Provision of Technical Information

279. Industry Canada sought comments on the proposed wording for the condition of licence related to the provision of technical information.

Summary of Comments

280. All respondents who commented on this issue agreed with the proposed wording for the condition of licence.

Decision

281. In consideration of the above, the condition of licence will be stated as follows:

When Industry Canada requests technical information on a particular station or network, the licensee must provide the information in accordance with the definitions, criteria, frequency and timelines specified in the request. For further information, refer to Client Procedures Circular CPC-2-1-23, *Licensing Procedure for Spectrum Licences for Terrestrial Services*, as amended from time to time.

6.8 Compliance with Legislation, Regulation and Other Obligations

282. Industry Canada sought comments on the proposed wording for the condition of licence related to the compliance with legislation, regulation and other obligations.

283. The proposed wording was as follows:

The licensee is subject to, and must comply with, the Radiocommunication Act, the Radiocommunication Regulations and the International Telecommunication Union's Radio Regulations pertaining to its licensed radio frequency bands. The licence is issued on condition that the certifications made in relation to this licence are all true and complete in every respect. The licensee must use the assigned spectrum in accordance with the Canadian Table of Frequency Allocations and the spectrum policies applicable to these bands, as amended from time to time.

Summary of Comments

284. All respondents who commented on this issue agreed with the proposed wording.

Discussion

285. Licensees are required to abide by the requirements set out for use of the radio frequency spectrum in general and for the specific frequency band being licensed. These requirements are fundamental, and in some cases, they are legislative requirements.

286. Upon further review of this condition of licence, Industry Canada is of the view that the removal of the reference to the International Telecommunication Union's (ITU) *Radio Regulations* from the proposed wording would be clearer. Although conformity with respect to the ITU's *Radio Regulations* and related international agreements continues to apply to Canada, the relevant requirements for licensees are included in the *Canadian Table of Frequency Allocations*, the *Radiocommunication Regulations*, policies and conditions of licence. The Canadian Table and the associated general information will, need to be revised from time to time. Such revisions occur when changes to the ITU's Table are made as a result of World Radiocommunication Conferences or particular Canadian radio service requirements. The *Canadian Table of Frequency Allocations* reflects international changes while taking into account Canadian requirements to ensure that government, commercial and private users have full flexibility to develop new radio applications.

Decision

287. In consideration of the above, the condition of licence will be stated as follows:

The licensee is subject to, and must comply with, the *Radiocommunication Act* and the *Radiocommunication Regulations*, as amended from time to time. The licensee must use the assigned spectrum in accordance with the *Canadian Table of Frequency Allocations* and the spectrum policies applicable to this band, as amended from time to time. The licence is issued on condition that all representations made in relation to obtaining this licence are all true and complete in every respect.

6.9 Technical Considerations, and International and Domestic Coordination

288. Industry Canada sought comments on the proposed wording for the condition of licence related to the technical considerations and international and domestic coordination.

Summary of Comments

289. All respondents who commented on this issue agreed with the proposed wording for the condition of licence.

Decision

290. In consideration of the above, the condition of licence will be stated as follows:

The licensee must comply on an ongoing basis with the technical aspects of the appropriate Radio Standards Specifications (RSS) and Standard Radio System Plans (SRSP), as amended from time to time. Where applicable, the licensee must use its best efforts to enter into mutually acceptable agreements with other parties for facilitating the reasonable and timely development of their respective systems, and to coordinate with other licensed users in Canada and internationally.

The licensee must comply with the obligations arising from current and future frequency coordination agreements established between Canada and other countries and shall be required to provide information or take actions to implement these obligations as indicated in the applicable SRSP. Although frequency assignments are not subject to site licensing, the licensee may be required through the appropriate SRSP to furnish all necessary technical data for each relevant site.

6.10 Lawful Intercept

291. Industry Canada sought comments on the proposed wording of the condition of licence related to lawful intercept requirements. The proposed condition included changes to bring the wording in line with current technologies, namely by updating references to “circuit-switched voice telephony” technology.

292. The proposed wording was as follows:

A licensee operating as a service provider using an interconnected radio-based transmission facility for compensation must provide for and maintain lawful interception capabilities as authorized by law and in accordance with the Solicitor General’s Enforcement Standards for Lawful Interception of Telecommunications, as amended from time to time.

The licensee may request the Minister of Industry to forbear from enforcing certain assistance capability requirements for a limited period. The Minister, following consultation with Public Safety Canada, may exercise the power to forbear from enforcing a requirement or requirements where, in the opinion of the Minister, the requirement is not reasonably achievable. Requests for forbearance must include specific details and dates indicating when compliance to the requirement can be expected.

Summary of Comments

293. Most respondents who commented on this issue disagreed with the proposed changes. Many respondents referred to, and agreed with, comments submitted by the CWTA, which noted that replacing “circuit-switched telephony systems” with “interconnected radio-based transmission facility for compensation” would open up additional services such as Internet, cable and broadcasting to interception requirements. The CWTA also noted that such changes would be more appropriately made through federal legislation or pending revisions to the Solicitor General’s standards as proposed by Public Safety Canada.

Discussion

294. The condition of licence on lawful intercept was first introduced in 1996 for Personal Communications Services (PCS) spectrum licences. Since then, this condition has been applied to most spectrum licences where the licensee was a radiocommunication carrier, as this is the only class of licensee that carries public traffic to and from the public networks (telephone and Internet).

295. The rationale for removing the reference to a specific technology was to ensure that the requirement would remain meaningful in a Long Term Evolution (LTE) network environment, which uses packet-switched based technology instead of circuit-switched technology. The intent was not to expand the requirement to additional services.

296. Given the above, Industry Canada notes that removing the reference to “circuit-switched” while maintaining the reference to “voice telephony systems” would serve the original intent while effectively maintaining the scope of the condition, similar to that of other services, namely the requirement to intercept voice communications.

297. Furthermore, the term “radiocommunication carrier” is being replaced with “telecommunication common carrier” to ensure consistency with the *Telecommunications Act* and related regulations, noting that both terms have similar definitions.

Decision

298. In consideration of the above, the condition of licence will be stated as follows:

The licensee operating as telecommunication common carrier using the spectrum for voice telephony systems must, from the inception of service, provide for and maintain lawful interception capabilities as authorized by law. 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.

The licensee may request the Minister of Industry to forbear from enforcing certain assistance capability requirements for a limited period of time. The Minister, following consultation with Public Safety Canada, may exercise the power to forbear from enforcing

a requirement or requirements where, in the opinion of the Minister, the requirement is not reasonably achievable. Requests for forbearance must include specific details and dates indicating when compliance to the requirement can be expected.

6.11 Research and Development

299. Industry Canada sought comments on the proposed wording of the condition of licence related to research and development (R&D).

Summary of Comments

300. The CWTA submitted that the condition of licence is no longer appropriate or required. It added that the industry has demonstrated continuous investment in coverage and capacity of networks and suggested that the R&D condition constrains a significant amount of capital in pursuit of goals that are already being met in the marketplace. Bell, MTS Allstream, Public Mobile, Quebecor, Rogers, SaskTel, Shaw, Tbaytel, TELUS and WIND do not support the condition of licence, either of their own accord or by supporting the CWTA's position.

301. Sogetel initially recommended that the exemption threshold be increased from \$5 million to \$100 million. However, in its reply comments, Sogetel supported the CWTA's position.

Discussion

302. The decision with regard to the condition of licence on research and development which applies to spectrum licences in various bands will be announced through a separate decision paper. Therefore, until such a time as a decision is released, the R&D condition of licence will apply to spectrum licences in the 700 MHz band, as proposed in the consultation, but may be amended during the licence term.

Decision

303. In consideration of the above, the condition of licence will be stated as follows:

The licensee must invest, as a minimum, 2 percent of its adjusted gross revenues resulting from its operations in this spectrum, averaged 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. Businesses with less than \$5 million in annual gross operating revenues are exempt from research and development expenditure requirements, except where they have affiliations with licensees that hold other licences with the research and development condition of licence and where the total annual gross revenues of the affiliated licensees are greater than \$5 million.

To facilitate compliance with this condition of licence, the licensee should consult Industry Canada's [Guidelines for Compliance with the Radio Authorization Condition of Licence Relating to Research and Development](#) (GL-03).

6.12 Rural Deployment Requirements

304. In SMSE-002-12, Industry Canada stated its intent to facilitate the deployment of next-generation mobile services to rural communities within a reasonable time frame and announced its policy decision to implement a rural deployment requirement for spectrum in the 700 MHz band.

305. In the consultation, Industry Canada proposed the following wording to reflect its decision regarding the condition of licence for rural deployment requirements:

Where a licensee holds a licence for two or more paired blocks of 700 MHz spectrum in a licence area, or has access to two or more paired blocks of 700 MHz spectrum in a licence area either directly or indirectly, that licensee must deploy 700 MHz spectrum:

- (a) to cover 90% of the population of its high-speed packet access (HSPA) network footprint as of March 2012, within five years of the issuance of the initial 700 MHz licence; and*
- (b) to cover 97% of the population of its high-speed packet access (HSPA) network footprint as of March 2012, within seven years of the issuance of the initial 700 MHz licence.*

306. It also proposed that, in interpreting the above-noted condition, “access to two or more paired blocks of spectrum” would include scenarios where a 700 MHz licensee has an agreement with another licensee in the same licence area that provides for the latter to operate some or all of the spectrum licensed to the primary licensee (e.g. where the licensees are associated and Industry Canada has determined that the spectrum aggregation limits will apply individually). In addition, agreements where licensees are associated through an agreement that provides the ability to influence the use of the spectrum would count as indirect access.

307. The consultation also proposed that tower and site sharing not be considered as agreements that provide “access” for this condition of licence and, furthermore, that typical roaming agreements¹⁵ not be considered as providing “access to two or more paired blocks of spectrum” for the purpose of this condition of licence.

308. Industry Canada sought comments on the application of the proposed wording of the condition of licence and, specifically, on the assessment of “access to two or more paired blocks of spectrum” for the purposes of this condition of licence.

Summary of Comments

309. None of the respondents who commented on this issue suggested changes to the proposed wording; however, some asked for further clarity.

310. Most of the comments received on this issue were in relation to the policy decision and the design of the condition of licence itself, and not necessarily with regard to its application. Respondents who supported the proposed wording and application included BCBA, Public Mobile and Sogetel. Mobilicity noted that the rural deployment condition was a sensible way to ensure licence build-out in rural areas without putting undue economic burdens on licensees. TELUS noted that it would only support the

¹⁵ Refer to Section 5.2.1 of this Framework for a definition of typical roaming agreements.

proposed wording and interpretation subject to Industry Canada adopting TELUS' recommended changes to the general deployment requirements.

311. Some respondents expressed concerns about the application of the condition itself, whereas others commented on the potential impact and effectiveness of the requirement. These comments were not within the scope of the current consultation.

312. Rogers noted that roaming, tower sharing, backhaul and equipment purchasing agreements should not result in any obligations and added that "ability to influence" the use of spectrum is vague and should also not result in any obligations to deploy.

Discussion

313. Industry Canada announced its policy decision on the implementation and details of rural deployment requirements in the 700 MHz auction in March 2012 through SMSE-002-12. This decision followed a public consultation process (SMSE-018-10)¹⁶ in which stakeholder views were heard and considered in relation to any measures necessary to ensure further deployment in rural and remote areas. As additional comments on this issue were not within the scope of the current consultation, they were not considered in the final wording for the condition of licence.

314. *Access to two blocks*: In the consultation, comments were also sought on the assessment of "access to two or more paired blocks of spectrum" for the purposes of this condition of licence. The majority of respondents did not object to the application of the proposed wording or to the interpretation of "access to two or more paired blocks of spectrum."

315. This condition is intended to be applied to those companies best positioned to deliver services to rural areas (i.e. those with sufficient spectrum and infrastructure to deploy at the lowest cost). As a result, the condition of licence will only apply to licensees that had an HSPA network as of March 2012, and either directly (through the purchase of spectrum licences) or indirectly (through associations with others) have access to two blocks of 700 MHz spectrum.

316. In order to maximize the benefit of this condition of licence and to clarify its interpretation, note that any associations between licensees related to carrying subscriber traffic involving the 700 MHz spectrum (other than typical roaming agreements as defined in Section 5.2.1), will be considered to have provided access to both licensees in the particular licence area. Where carriers consider that this should not apply given extenuating circumstances, they may provide Industry Canada with an explanation of the particulars for consideration.

317. Industry Canada will not consider tower and site sharing as agreements that provide "access" for this condition of licence.

318. Furthermore, typical roaming agreements (as defined in Section 5.2.1) will not be considered as providing "access to two or more paired blocks of spectrum" for the purpose of this condition of licence.

¹⁶ SMSE-018-10, *Consultation on a Policy and Technical Framework for the 700 MHz Band and Aspects Related to Commercial Mobile Spectrum*, November 2010.

319. Where a licence is transferred during the initial seven years, the requirement for the new licensee to deploy to a percentage of its HSPA footprint will continue to be based on the initial licence issuance date.

Decision

320. In consideration of the above, the condition of licence will be stated as follows:

Where the licensee holds licences for two or more paired blocks of 700 MHz spectrum in a licence area, or has access to two or more paired blocks of 700 MHz spectrum in a licence area either directly or indirectly, the licensee must deploy 700 MHz spectrum:

- (a) to cover 90% of the population of its HSPA network footprint as of March 2012, within five years of the issuance of the initial 700 MHz licence; and**
- (b) to cover 97% of the population of its HSPA network footprint as of March 2012, within seven years of the issuance of the initial 700 MHz licence.**

For the purpose of this condition, “access” includes situations where a licensee enters into an agreement with another 700 MHz licensee in the same licence area that provides the ability to carry the other licensee’s subscriber traffic (other than via a typical roaming agreement) regardless of whether the frequencies of both licensees are in use. In determining whether a party has access, Industry Canada may review documentation that sets out the details of any agreement to use the spectrum, agreements related to network architecture or any other technical or commercial information or agreements between the parties.

The licensee must notify the Minister of Industry of any new agreement that would provide the licensee with access to spectrum in any licence area where this condition has not yet been satisfied. In addition, the licensee must provide the Minister with any documentation or information related to spectrum access or HSPA network footprints at the Minister’s request.

6.13 General Deployment Requirement

321. In SMSE-002-12, Industry Canada announced that a general deployment requirement will apply to licensees in the 700 MHz band. Through the current consultation, comments were sought on the details of this requirement, including the proposed population coverage of between 20% and 50%, depending on the specific licence area and the proposed 10-year time frame by which the requirement must be met.

Summary of Comments

322. *Requests for increased requirements and shorter time frames:* TELUS commented that the proposed requirements were not ambitious enough and that they could result in inadequate deployment requirements and a lack of balance between the build/roam incentives. It suggested more ambitious rollout at years 5 and 7 of the licence term for all licensees that have access to prime blocks of spectrum (B, C, C1 or C2). In its reply comments, Bell supported TELUS’ proposal.

323. Eastlink, MTS Allstream and SaskTel noted that the proposed deployment requirements would not have a positive impact on rural areas. They offered various proposals to address this issue, including deployment to 50% of the population at a Tier 4 level, deployment to 90% of the population for blocks B and C, and increased levels to 95% of the population for all licensees.

324. *Agreement with proposed levels:* Cogeco, Rogers, Sogetel and WIND all agreed with the proposed condition; however, Cogeco added that the 10-year time frame is excessive and proposed that Industry Canada consult on implementing a “use it or lose it” policy. TELUS suggested that the proposed requirement levels should only apply to the lower A, D and E blocks given the ecosystem challenges associated with these blocks.

325. *Lower deployment requirements:* Xplornet and Tbaytel commented that the proposed targets were too high, and that they should be lowered to recognize the lower population densities and higher cost of service in rural and remote areas.

326. *Compliance measures:* SaskTel suggested modifications to the proposed condition text: (a) a “use it or lose it” clause where the spectrum is not put to use, and (b) a “use it or share it” clause in cases where the licensee has deployed in parts of the licensed area, but not in other parts thereby allowing others to gain access to unserved areas. TELUS also suggested two additional clauses in the instance of failure to meet the requirement: (a) that any licensee seeking in-territory roaming should be required to subordinate its 700 MHz licence, and (b) that any licensee failing to meet the requirements, including marketing the service, should be forced to sell the spectrum on the secondary market or return it to Industry Canada.

Discussion

327. *Objective:* The objective of this general rollout requirement is to ensure that the 700 MHz spectrum, a highly valued and limited public resource, is deployed in a timely manner.

328. Similar conditions of licence have been applied to previously auctioned spectrum licences in order to encourage the deployment of systems and to dissuade speculative spectrum acquisition. Prior to the AWS auction, the deployment requirement was to 50% of the population in the licence area or to a level acceptable to Industry Canada. In the AWS auction, different levels were set for each licence area based on the population of the major urban centres for that particular licence area. In its consultation, Industry Canada proposed that the AWS levels be used as deployment requirements for the 700 MHz licences and that licensees be required to reach these levels within 10 years of the licence issuance. This would allow market forces to determine the best pace of deployment while providing an opportunity to intervene if the spectrum were left unused for an extended period of time.

329. *Impact of increased levels:* The general deployment condition will apply to all 700 MHz licensees regardless of the number of blocks that they hold, and its intent is to deter speculation and ensure the use of the spectrum. In comparison, the rationale for the rural deployment requirement to reach 90% and 97% of the population within a specified time frame was based on the increased network efficiencies that would be realized by those with access to two or more blocks of paired spectrum. Industry Canada therefore considers that increasing the general deployment requirements is unnecessary and that an increase could impose a significant burden on licensees with only one block of spectrum.

330. *Impact of shorter time frames:* Industry Canada notes that reducing the timeline to meet the requirement is not expected to have any impact on incumbent licensees, as they likely have infrastructure in place and the financial capacity to meet a general deployment requirement. However, for AWS licensees, a deployment at five years would align with the requirement to complete the AWS general deployment requirements by the end of that licence term. This would be particularly burdensome for those that are required to deploy new tower and backhaul infrastructure to meet their AWS requirements. Reducing the timeline would likely have an even greater impact on any new carriers acquiring 700 MHz spectrum, as they may not have any infrastructure in place.

331. *Different deployment levels for specific blocks:* Industry Canada has considered arguments that there is uncertainty with regard to the future availability of equipment for blocks A, D and E in the 700 MHz band. However, recent 4G LTE service deployments using block A in the United States indicate that some equipment is available and deployed in this block (Band 12).

332. For the unpaired spectrum blocks D and E, however, there is more uncertainty with regard to the future availability of equipment. According to published plans, research and development are currently under way regarding unidirectional wireless systems, which will make use of this spectrum in conjunction with spectrum in the AWS band. Although the availability of devices for specific blocks of spectrum may affect the ability of licensees to comply with deployment requirements, it is estimated that the 10-year time frame to reach the levels required is long enough to allow for the development of related systems to make use of these blocks.

333. *Impact of lower deployment levels:* As noted by Xplornet and Tbaytel, rural and remote service areas have lower population densities and a higher cost of service, making a business case more difficult.

334. Overall, the 700 MHz band has excellent propagation characteristics and is considered to be important in the deployment of next-generation mobile broadband services in rural areas and in meeting the increasing demand and network congestion in urban areas. Industry Canada does not consider that reducing the deployment requirements to a level lower than those reflecting the more populated centres within a tier is in alignment with the intent of the condition.

335. *Compliance measures:* In response to the proposed compliance measures such as a “use it or share it” condition of licence, Industry Canada notes that such a condition is premature at this time and will instead first provide an opportunity for deployment in accordance with the rest of the conditions. In SMSE-002-12, *Policy and Technical Framework Mobile Broadband Services MBS – 700 MHz Band and Broadband Radio Service (BRS) – 2500 MHz Bands*, Industry Canada noted that the *Policy for the Provision of Cellular Services by New Parties* (RP-019) will be reviewed. RP-019 allows third parties to apply to use spectrum in certain geographic areas where services are not currently being offered by the current licensee. However, it only applies to certain frequency bands and was adopted many years after the initial licences were issued in those bands. Should any changes be considered, a public consultation would be undertaken. However, it is not expected that any expansion of RP-019 would be applied to any bands within 10 years of initial licensing. Therefore, an expanded RP-019 is not expected to apply to the 700 MHz band for at least the next 10 years.

336. Upon further review of the condition of licence, and in consideration of the policy objectives stated in SMSE-002-12, Industry Canada has further clarified that the objectives are to help to ensure that spectrum is deployed in a timely manner for the benefit of Canadians living in each service area. The following sentence will therefore be added to the proposed condition of licence: “When the spectrum is put to use, it shall be used to provide services predominantly to Canadians within the service area.”

Decision

337. In consideration of the above, the condition of licence will be stated as follows:

Licensees will be required to demonstrate to the Minister of Industry that this spectrum has been put to use, as specified in the table below, within 10 years of the initial issuance of the licence. When the spectrum is put to use, it shall be used to provide services predominantly to Canadians within the service area.

Table 5 – General Deployment Requirements

Tier 2	Service Area Name	Minimum Population Coverage*
2-01	Newfoundland and Labrador	30%
2-02	Nova Scotia and P.E.I.	30%
2-03	New Brunswick	40%
2-04	Eastern Quebec	50%
2-05	Southern Quebec	50%
2-06	Eastern Ontario and Outaouais	50%
2-07	Northern Quebec	30%
2-08	Southern Ontario	50%
2-09	Northern Ontario	50%
2-10	Manitoba	50%
2-11	Saskatchewan	40%
2-12	Alberta	50%
2-13	British Columbia	50%
2-14	Yukon, NWT and Nunavut	20%

* Based on most recent census information available at the time of assessment.

Where the licence is transferred during the initial 10 years, the requirement for the new licensee to deploy will continue to be based on the initial licence issuance date. Deployment by a subordinate licensee will count towards the requirement of the primary licensee.

6.14 Mandatory Antenna Tower and Site Sharing

338. Industry Canada sought input from stakeholders on the implementation of changes proposed to the mandatory antenna tower and site sharing conditions of licence through a separate process announced through *Canada Gazette* notice DGSO-001-12.¹⁷ Stakeholders that were interested in the 700 MHz

¹⁷ See *Canada Gazette* notice DGSO-001-12, *Proposed Revisions to the Frameworks for Mandatory Roaming and*

licensing process were encouraged to participate in that consultation process, as changes will affect the 700 MHz licensees.

339. In anticipation that the above-noted process could result in modifications to Client Procedures Circular CPC-2-0-17, *Conditions of Licence for Mandatory Roaming and Antenna Tower and Site Sharing and to Prohibit Exclusive Site Arrangements*, Industry Canada sought comments on the proposed wording of the condition of licence related to mandatory antenna tower and site sharing.

Summary of Comments

340. None of the respondents who commented on this issue proposed any changes to the wording of this condition of licence.

341. Some respondents also took the opportunity to reference their comments submitted through DGSO-001-12. These comments were outside the scope of this consultation.

Discussion

342. The related decisions, including the applicability of the mandatory antenna tower and site sharing condition to the 700 MHz band, will be announced separately.

Decision

343. In consideration of the above, the condition of licence will be stated as follows:

The licensee must comply with the mandatory antenna tower and site sharing requirements set out in Client Procedures Circular CPC-2-0-17, *Conditions of Licence for Mandatory Roaming and Antenna Tower and Site Sharing and to Prohibit Exclusive Site Arrangements*, as amended from time to time.

6.15 Mandatory Roaming

344. Industry Canada sought comments from stakeholders on the implementation of changes proposed to the mandatory roaming condition of licence through a separate process announced through *Canada Gazette* notice DGSO-001-12.¹⁸ Stakeholders that were interested in the 700 MHz licensing process were encouraged to participate in that consultation process, as changes may affect the 700 MHz licensees.

Summary of Comments

345. None of the respondents who commented on this issue proposed any changes to the wording of this condition of licence.

Antenna Tower and Site Sharing (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10251.html>).

¹⁸ Ibid.

346. Some respondents also took the opportunity to reference their comments submitted through DGSO-001-12. These comments were outside the scope of this consultation.

Discussion

347. The related decisions, including the applicability of the mandatory roaming condition to the 700 MHz band, will be announced separately.

Decision

348. In consideration of the above, the condition of licence will be stated as follows:

The licensee must comply with the mandatory roaming requirements set out in Client Procedures Circular CPC-2-0-17, *Conditions of Licence for Mandatory Roaming and Antenna Tower and Site Sharing and to Prohibit Exclusive Site Arrangements*, as amended from time to time.

6.16 Annual Report

349. Currently, spectrum licences include a requirement to submit an annual report to Industry Canada to provide some basic information on spectrum use and existing company reports. This provides valuable information without requiring extensive report generation by the licensees.

350. Industry Canada sought comments of the proposed wording of the condition of licence as follows:

The licensee must submit an annual report for each year of the licence term, which includes the following information:

- *a statement indicating continued compliance with all conditions of licence;*
- *an update on the implementation and spectrum usage within the area covered by the licence;*
- *existing audited financial statements with an accompanying auditor's report;*
- *a report of the research and development expenditures for licensees operating as radiocommunication carriers as set out in these conditions of licence. Industry Canada reserves the right to request an audited statement of research and development expenditures with an accompanying auditor's report;*
- *supporting financial statements where licensees are claiming an exemption based on an annual gross revenue of less than \$5 million; and*
- *a copy of any existing corporate annual report for the licensee's fiscal year with respect to the authorization.*

Summary of Comments

351. Rogers WIND, Sogetel and SSi agreed with the proposed wording. However, SSi added that reports need not be audited due to the expense involved. MTS Allstream also supported the wording with the exception of the R&D requirement.

352. Bell argued that the annual report should be streamlined to reduce the administrative burden on licensees and the Department. It also raised concerns regarding the 120-day limit for filing the annual report and requested that the company be allowed to continue its long-standing practice of filing within 180 days of its fiscal year-end. TELUS supported Bell's proposal that the condition of licence allow for annual reports to be filed within 180 days of the licensee's fiscal year-end.

353. Bell and TELUS disagreed with the requirement to break down their deployment reports by licence. Bell recommended that licensees be able to address the licensee's total operating area, whereas TELUS recommended that the deployment level for "each licence area" be changed to "the most rolled up tier level that an operator holds," with Industry Canada reserving right to ask for more detail. TELUS noted that overall usage across a larger geographical area demonstrates a more complete picture of how the spectrum is being used.

Discussion

354. The purpose of the annual report is to provide basic information on spectrum use and existing company reports. This provides valuable information without requiring extensive report generation by licensees.

355. To date, the 120-day time limit after the licensee's fiscal year-end to submit its annual report has been sufficient for the majority of licensees reporting in other bands. Therefore, Industry Canada does not consider that an extension to 180 days is necessary. Where a licensee is unable to submit its annual report within this time frame, it may request an approval for an extension.

356. Industry Canada also reiterates the importance of reporting on deployment at an individual licence level in the assessment of compliance with any deployment requirements associated with the licences in various bands. This level of detail has been the standard to which all auction licences have been held in the past.

357. The condition states that audited reports must be submitted where they exist and, therefore, should not result in additional costs.

Decision

358. Given the above considerations, the condition of licence on annual reporting requirement will apply as proposed. Requirements may change over the course of the 20-year licence term. Accordingly, reporting requirements in relation to this condition of licence may be amended from time to time following the issuance of a notice to all licensees in advance of the relevant fiscal year end.

The licensee must submit an annual report for each year of the licence term, which includes the following information:

- **a statement indicating continued compliance with all conditions of licence;**
- **an update on the implementation and spectrum usage within the area covered by the licence;**
- **existing audited financial statements with an accompanying auditor's report;**

- a report of the research and development expenditures as set out in these conditions of licence. Industry Canada may request an audited statement of research and development expenditures with an accompanying auditor's report at its discretion;
- supporting financial statements where licensees are claiming an exemption based on an annual gross revenue of less than \$5 million;
- a copy of any existing corporate annual report for the licensee's fiscal year with respect to the authorization; and
- other information related to the licence as specified in any notice updating the reporting requirements as issued by Industry Canada.

All reports and statements are to be certified by an officer of the company and submitted, in writing, within 120 days of the licensee's fiscal year-end. Confidential information provided will be treated in accordance with subsection 20(1) of the *Access to Information Act*.

Reports are to be submitted to Industry Canada at the following address:

Manager, Emerging Networks
Spectrum Management Operations Branch
Industry Canada
300 Slater Street, 15th Floor
Ottawa, Ontario K1A 0C8

359. Where a licensee holds multiple licences, spectrum implementation reports should be broken down by licence area. This information, including the extent of implementation and spectrum usage, is important for reasons such as the analysis of each licensee's individual performance against its conditions of licence, monitoring the effectiveness of these conditions in meeting the policy objectives of the band, and Industry Canada's intention that the spectrum be deployed in a timely manner for the benefit of Canadians.

6.17 Amendments

360. The following condition of licence will also apply, consistent with spectrum licences in other bands:

361. **The Minister of Industry retains the discretion to amend these terms and conditions of licence at any time.**

7. Auction Process

362. The following section outlines the general process for submitting an application to participate in the 700 MHz auction, as well as the general requirements and rules that apply prior to, during and post-auction.

363. The schedule for the auction process (*Table of Key Dates*) is included on page iii of this Framework, and on Industry Canada's Spectrum Management and Telecommunications website at <http://www.ic.gc.ca/spectrum>. Items and time frames included in the schedule may be updated from time to time. Interested parties are advised to check the website for any updates to the schedule of events.

7.1 Application to Participate

364. To participate in an auction, all applicants must submit the completed application forms, along with the financial deposits, details of the applicant's beneficial ownership, information on any affiliations and associations as discussed in Section 5 of this Framework, and other documentation as required, by the date specified in the *Table of Key Dates*. Industry Canada will publish the list of applicants on its website soon thereafter.

365. The application forms for participation will be available on request by sending an email to: spectrum.auctions@ic.gc.ca. Additional documentation may be required in support of the application forms.

366. In addition to this Framework, the policies, rules and definitions associated with this licensing process are set out in the following documents:

- SMSE-002-12, *Policy and Technical Framework: Mobile Broadband Services (MBS) – 700 MHz Band, Broadband Radio Service (BRS) – 2500 MHz Band*;
- [Framework for Spectrum Auctions in Canada](#); and
- any amendment or supplement that may be issued by Industry Canada.

367. Licensees should also familiarize themselves with Client Procedures Circular CPC-2-1-23, [Licensing Procedure for Spectrum Licences for Terrestrial Services](#), and the other Client Procedures Circulars mentioned in the conditions of licence.

7.2 Submissions

368. To participate in the auction, all applicants must submit the completed application forms¹⁹ and financial deposits. In the interest of providing Industry Canada and other bidders with adequate information on the identity of all bidders, applicants are required to fully disclose the beneficial ownership for every entity that owns, directly or indirectly, 10% or more of the applicant's voting shares, non-voting shares, partnership interests, or any other beneficial interests, as the case may be. Associated entities wishing to participate separately in the 700 MHz auction are required to disclose the names of their associated entities within their application, and to provide narratives describing all key elements and the nature of the association in relation to the acquisition of the spectrum licences being auctioned and the post-auction relationships of the said entities. A list of applicants, their beneficial ownership information and the narrative on any associated entity relationships will be made available on Industry Canada's Spectrum Management and Telecommunications website at <http://www.ic.gc.ca/spectrum> prior to the auction, so that all bidders have knowledge of the identity of the other bidders. Applicants are not permitted to change their beneficial ownership within 10 days preceding the start of the auction.

¹⁹ The application forms will be available on request by sending an email to the following address: spectrum.auctions@ic.gc.ca.

369. The consultation proposed that associated entities be required to submit their application in advance of the final application deadline; however, Industry Canada has determined that such applications may be submitted any time up to and including the final application deadline. Furthermore, entities are encouraged to approach Industry Canada at least two weeks prior to the application date if seeking guidance or a pre-determination as to whether their arrangement or proposed arrangement would be considered to give rise to a finding of association under this Framework.

7.3 Pre-auction Financial Deposits

370. In order to maintain the integrity of the auction, Industry Canada requires that all bidders submit a pre-auction financial deposit with their application.

371. In its consultation, Industry Canada proposed to determine the value of the pre-auction financial deposit based on the licences on which the applicant wishes to be eligible to bid. Each licence has been assigned a specific number of eligibility points that are approximately proportionate to the population covered by the licence and it was proposed that the financial deposit be equal to \$130,000 per eligibility point.

Summary of Comments

372. Rogers, SaskTel, TELUS and WIND supported the proposed financial deposits, whereas Sogetel and SSI suggested that the proposed financial deposits were too high.

373. Bell proposed a daily financial guarantee equal to 100% of the value of a bidder's previous day's last package bid, stating that this would enhance meaningful bidding, discourage gaming and promote the overall integrity of the auction. In its reply comments, TELUS supported the intent of this proposal, but did not find it practical. TELUS proposed that deposits be subject to a weekly top-up process.

374. In the reply comments, Rogers, MTS Allstream and WIND were opposed to Bell's proposal, arguing that it would make the auction more financially onerous for smaller bidders and that it would add complexity to the auction process. WIND added that there was no evidence of any winning bidders defaulting on payments in the last auction.

Discussion

375. A requirement for daily or weekly top-up financial deposits would result in an additional administrative burden and it is noted that, to date, no provisional winner in an Industry Canada spectrum auction has defaulted on its payment.

376. Based on the above considerations, Industry Canada is of the view that requiring daily or weekly financial deposits is not warranted at this time. However, as in past auctions, Industry Canada will retain the right to request additional deposits during the auction.

Decision

377. Pre-auction financial deposits will be equal to \$130,000 per eligibility point. Eligibility points associated with each licence are listed in Table 4 of this Framework. As part of its application, a bidder will be required to submit 5% of its total pre-auction financial deposit. The remaining 95% of its pre-auction financial deposit will be due at a later date, as specified in the *Table of Key Dates* on page iii of this Framework. The deposits are to be in the form as described in Section 7.4.

378. An individual bidder requesting to be eligible to bid on the equivalent of one national paired block will be required to submit deposits covering 1,221 points, which will equate to \$158,730,000 (i.e. \$130,000 x 1,221). Financial deposit(s) will be returned to any applicant that is found not to be a qualified bidder and to any applicant that provides written notification to Industry Canada of its withdrawal from the process prior to the auction's commencement. Financial deposits will be returned to unsuccessful bidders once the auction has closed.

379. Consistent with previous auctions, Industry Canada reserves the right to request additional financial deposits during the auction. This will be determined by considering factors such as the bid value on a package of licences and the bidding activity. The additional financial deposit will be based on a percentage, not exceeding 50%, of the value of the bidder's package bid for licences in a specified round. Bidders will be provided three full business days to submit their additional financial deposits to Industry Canada. The deposits are to be in the form as described in Section 7.4.

7.4 Process to Submit the Applications and Financial Deposits

380. The application forms, the associated documents (as per the instructions provided on the application forms), and 5% of the total pre-auction financial deposit are to be physically delivered to the Manager, Auction Operations (address provided in Section 13), by the date specified in the Table of Key Dates on page iii of this Framework. Industry Canada reserves the right, under exceptional circumstances, to accept additional documentation after the initial deadline, but prior to publication of the list of applicants. **Applications that are received without a deposit for 5% of the total financial pre-auction deposit will be rejected. The remaining 95% of the total pre-auction financial deposit is to be physically delivered as stated above, by the date specified in the Table of Key Dates on page iii of this Framework. Applicants that fail to submit this deposit by the deadline will not be qualified to participate in the auction.**

381. Upon receipt of the application and the associated documentation, Industry Canada will send notification to the applicant that the application materials have been received and confirming the amount of the deposit that has been submitted. This notice will not be an indication that the application materials or the deposits have been approved.

382. The financial deposits must be in the form of a certified cheque, bank draft, money order, wire transfer, or an irrevocable standby letter of credit, payable to the Receiver General for Canada, drawn on a financial institution that is a member of the Canadian Payments Association. The elements required in a letter of credit, as well as a sample letter of credit acceptable to Industry Canada, are provided as part of the application forms.²⁰ Multiple letters of credit (or other forms of payment) from one or more financial institutions will be permitted within reason. Industry Canada will treat the financial deposit for

²⁰ The application forms will be available on request by sending an email to the following address: spectrum.auctions@ic.gc.ca.

an applicant as being the sum of the amounts of each accepted deposit. Each financial deposit must comply with the conditions laid out herein. Financial deposits shall not have any conditions requiring the Receiver General for Canada to draw upon payments in any particular order of priority, or requiring any deposit to be drawn upon completely before drawing upon any other deposit. In the event that a qualified bidder does not become a provisional licence winner, the financial deposits that were submitted in the form of a letter of credit will be returned. Refunds to deposits submitted in the form of a certified cheque, bank draft, money order or wire transfer will likely take longer (perhaps several weeks longer) than a refund submitted by way of a letter of credit, as a cheque from the Receiver General for Canada will need to be processed.

383. If prior to the application deadline, an applicant would like to amend any of the forms that it has submitted and/or its financial deposits, it may submit one or more amended forms and/or financial deposits with an accompanying letter explaining that the enclosed form(s) and/or financial deposits are to replace the one(s) previously submitted. Any such amendments are to be physically delivered to the Manager, Auction Operations, by the receipt deadline for applications to participate in the auction. An applicant may decrease, but may not increase, its eligibility and applicable financial deposit until the receipt deadline for the remaining portion (95%) of the full financial deposit.

384. Upon receipt of an amended form(s) and/or financial deposits, Industry Canada will send a notification to the applicant that the amended form(s) and/or deposits have been received. The notification will state the amount of the new deposits that have been submitted. Where the financial deposits are in the form of an irrevocable standby letter of credit, the initial irrevocable standby letter of credit will also be returned to the applicant where applicable. Where the financial deposits are in a form other than an irrevocable standby letter of credit, any partial reimbursement of the initial financial deposits may take several weeks.

385. A list of all applicants will be made public via Industry Canada's Spectrum Management and Telecommunications website at <http://www.ic.gc.ca/spectrum>. The publication of this list does not mean that these applicants have been approved as qualified bidders.

7.5 Bidder Qualification

386. Industry Canada will begin to review the application forms (and any associated documents) and the accompanying financial deposit(s) after the closing date for the submission of applications. In this initial review, Industry Canada will identify any errors in the application forms or financial deposits. It will also determine whether any additional information related to any affiliate or associated entity of the applicant, is required. Applications that are received without a deposit for 5% of the full financial pre-auction deposit by the application deadline, or without a deposit for the remaining 95% of the full financial deposit by its deadline, will be rejected.

387. Following the initial review period, Industry Canada will provide applicants with an opportunity to correct any errors or inconsistencies in their application or financial deposits, and will request any additional information related to the affiliates or associated entities, where applicable. The original applications may be returned to the applicant with a brief statement outlining any discrepancy(ies) and/or omission(s), or requesting additional information. The applicant will be invited, in writing, to resubmit the corrected form and/or the additional information and to physically deliver this to the Manager, Auction Operations, at the address provided in Section 13, by the date specified in the written statement.

388. Applicants that do not comply with this request will have their application to participate in the auction rejected. Applications that are rejected, including those for which an opportunity has been provided to correct errors or inconsistencies identified by the Industry Canada, but are still found to be deficient, will be returned to the applicant outlining the deficiencies and will include the applicant's deposits.

389. Applicants that have submitted acceptable application materials, including the accompanying initial financial deposit of 5% of the total pre-auction deposit, will receive a confirmation letter that they have provisionally qualified to participate in the auction. Provisionally qualified applicants will be considered fully qualified, once the remaining 95% of the full pre-auction financial deposit has been received by Industry Canada, by the stated deadline. Qualified bidders will receive additional information related to their participation in the auction through separate mail-outs at a later date. This information will include, among other items, a bidder information document, a user manual and the schedule for the information session and mock auctions.

390. A list of all provisionally qualified bidders, along with information related to their beneficial ownership, affiliates, and associated entities will be made public via Industry Canada's website in accordance with the timelines stated in the Table of Key Dates on page iii of this Framework. Should any of the provisionally qualified bidders fail to provide the remaining portion of the full pre-auction financial deposit by the stated deadline, their application will be rejected and the list of qualified bidders will be amended accordingly.

7.6 Withdrawal of Application Forms

391. Applicants wishing to withdraw their application materials and have their financial deposits returned may do so, without prejudice, by sending a written request to the Manager, Auction Operations, at the address provided in Section 13. This request is to be physically delivered prior to 12:00 noon, (EST) on the business day preceding the opening of the auction.

7.7 Change of Information

392. Only the Auction Authorized Representative²¹ of the bidding company may notify the Manager, Auction Operations, of any material changes in the information submitted in the application documents. This includes any changes to the names and contact information of qualified bidders and designated bidders. Written notification must be sent by the Auction Authorized Representative to the address provided in Section 13, within five business days of such changes.

²¹ Refer to the application forms which will be made available upon request by sending an email to the following address: spectrum.auctions@ic.gc.ca.

7.8 Backup Procedures

393. Bidders are strongly advised to prepare contingency plans and backup facilities and locations, including multiple means of accessing the Internet, in the event of technical difficulties at their primary bidding locations. In previous SMRA auctions, Industry Canada had made provisions for eligibility rule waivers to be used in the case where a bidder was unable to submit its bid during a given round (for example, due to technical difficulties). Such waivers are not suitable in the context of a CCA format and its related activity rules. In response to the consultation, Rogers suggested the use of extension rights as an alternative to waivers. The extension rights would allow bidders to unilaterally extend the length of a bidding round. MTS Allstream rejected this suggestion, stating that it could add numerous delays to the auction. The final detailed provisions concerning backup procedures will be made available to qualified bidders prior to the start of the auction. However, Industry Canada reserves the right to extend the length of a round, or to alter the bidding schedule, in the event of being notified that a bidder(s) is experiencing technical difficulties at its primary and backup bidding locations, which prevents the bidder(s) from submitting a bid.

394. In the application forms, applicants must designate up to three individuals who will have authority to place bids on their behalf. Each designated bidder will receive individual codes to participate in the auction. Having more than one individual designated as a bidder will strengthen backup contingency plans for applicants in case of unforeseen problems. Industry Canada cannot guarantee any specific turn around time for changes or additions submitted after the application date.

395. As a last resort, provisions will be made for Industry Canada staff to submit bids on a bidder's behalf. This is a limited backup facility for bidders who experience technical difficulties which prevent them from accessing the auction system. Only the individuals listed as designated bidders will be able to use this option. Details of these provisions will be provided to the qualified bidders prior to the start of the auction.

8. Post-auction Process

8.1 Bidder Payment

396. Within **10 business days** following the announcement of provisional winners, each provisional licence winner will be required to submit 20% of its final payment.

397. The remaining portion, 80% of the final payment, will be due within 30 business days of the announcement of the provisional licence winners. Failure by the winning bidder to make these final payments in a timely fashion will result in the licence not being issued and the bidder will be subject to the applicable forfeiture penalty (see Section 8.2 – *Forfeiture Penalties*). These final payments will be non-refundable. If the licence winner fails to make these payments within the specified period, then the provisional winner's irrevocable standby letter of credit will be drawn upon.

398. **All payments must be made by certified cheque, bank draft, or wire transfer, payable to the Receiver General for Canada, drawn on a financial institution that is a member of the Canadian Payments Association.**

399. These payments for the initial 20-year term are in lieu of any fees that will be fixed for the radio authorization under the *Radiocommunication Act* or any other Act.²²

8.2 Forfeiture Penalties

400. Following the conclusion of the auction, winning bidders that fail to comply with the specified payment schedule or fail to come into compliance with the eligibility requirements stated in Section 6.4 of this Framework will forfeit their right to the licence. Furthermore, non-compliant bidders will be subject to a penalty in the amount of the difference between the forfeited licence payments and the eventual revenue from payments or fees for the licence(s), if the eventual revenues are lower than the forfeited licence(s) payment(s) (to be determined by a subsequent licensing process). This is referred to as the interim proxy forfeiture penalty.

401. In the event of licence forfeiture, the bidder's financial deposit will be drawn upon for the full amount of the interim proxy forfeiture penalty. If the interim proxy forfeiture penalty is greater than the full amount of the bidder's financial deposit combined with any partial payment, or if a deposit in the form of a letter of credit has been returned before the forfeiture, then the difference will be owing and payable to the Receiver General for Canada.

402. A bidder that forfeits on a licence, or any of that bidder's affiliates and associated entities, may not be eligible to bid on it in any subsequent licensing process.

8.3 Eligibility Documentation

403. Bidders that are declared provisional licence winners will be required to submit two copies of documentation related to their compliance with the condition of licence regarding eligibility in accordance with Section 6.4 – *Eligibility*. Documentation must be submitted by the provisional winners within 10 business days of being notified that they are the provisional licence winners. For further information, refer to Client Procedures Circular CPC-2-0-15, *Canadian Ownership and Control*, as amended from time to time.

404. Industry Canada will review these documents expeditiously. The Department will then notify each provisional licence winner regarding compliance with the eligibility requirements. In the event that a provisional licence winner does not, in the opinion of Industry Canada, comply with the eligibility requirements, Industry Canada will provide the provisional licence winner with an opportunity to make changes in order to become compliant.

405. At any point in time, Industry Canada may formally notify a provisional winner that outstanding documents must be provided within 60 days. This would normally transpire only if a significant period of time has passed since the close of the auction. If the provisional winner fails to comply within 60 days following a formal notification by the Department, the provisional winner may be deemed ineligible to hold a licence. In such a case, licences will not be issued and the provisional winner would also be subject to the interim proxy forfeiture penalties outlined in Section 8.2.

²² As per subsection 5(1.3) of the *Radiocommunication Act*.

8.4 Issuance of Licences

406. Industry Canada will issue spectrum licences to provisional winners upon completion of the following: (1) payment of the sum of their bids and the sum of their penalties, if any; and (2) a determination by the Department that the eligibility requirements have been met. If a Canadian ownership and control review is required, such a determination may take several months to complete depending on the complexity of the provisional winners' ownership and control structures and the responsiveness of the winners in providing any required additional documentation.

9. Bidder Training and Support

407. The consultation noted that qualified bidders would receive the necessary information to participate in the auction several weeks prior to the start of the auction, and proposed that a mock auction be held one week prior to the start of the auction in order to allow qualified bidders to better familiarize themselves with the bidding process.

Summary of Comments

408. *Software Considerations and Mock Auctions*: Many respondents, including Rogers, Bell, MTS Allstream, Public Mobile, SaskTel, Tbaytel and Xplornet, requested access to the winner and price determination tool (also known as the solver) at least three months prior to the auction. They stated that without access to the solver, bidders cannot verify if the auction process works adequately or audit their own auction simulations.

409. Some respondents also requested additional tools and information, including a detailed guide for uploading and editing supplementary bids, data file formats for the round results and screenshots of the auction software.

410. There was a general consensus that multiple mock auctions would be required for bidders to become familiar with the auction software.

411. *Information Sessions*: Both Rogers and Xplornet requested that Industry Canada conduct additional information and training sessions in order to help bidders to become familiar with the CCA software.

412. *Auction Schedule*: Bell, MTS Allstream, Rogers, TELUS and Xplornet requested that a detailed schedule of the auction process be released as soon as possible.

Discussion

413. *Software Considerations and Mock Auctions*: Industry Canada notes that providing earlier access to a stand-alone winner and price determination tool would allow more time for bidders to become familiar with the software and to prepare for their participation in the auction. It should be noted that rules and formulas used by the winner and price determination tool are currently available on Industry Canada's Spectrum Management and Telecommunications website; however, the related software is not yet available.

414. In previous auctions, a mock auction was usually conducted one week prior to the start of the auction. Given the new CCA format and software, Industry Canada considers that conducting additional mock auctions would be beneficial for bidders.

415. Industry Canada will provide qualified bidders with a bidder information document and a bidder user manual containing screenshots of the auction software, along with detailed bidding instructions, software requirements and the data definitions of the round results files.

416. *Information Sessions*: Industry Canada conducted a CCA information session in May of 2012. As in the past, Industry Canada plans to host an information session for qualified bidders prior to the mock auctions. The information session will address the auction process, the policies that affect bidding activity (e.g. spectrum aggregation limits) and the functionality of the software.

Decision

417. Approximately six weeks prior to the auction, qualified bidders will be provided with access to the winner and price determination tool for the allocation stage, on a website hosted by Industry Canada. Qualified bidders will be advised when it becomes available.

418. One information session and up to three mock auctions will be conducted prior to the auction. Each mock auction will last one to two days and will begin approximately five weeks prior to the auction. The final schedule for the mock auctions will be included in the bidder information document.

419. Approximately seven weeks prior to the start of the auction, bidder information documents and the bidder user manual will be sent to qualified bidders. These documents will contain the schedule for the information session and the mock auctions, as well as screenshots of the software and the data definitions of the round results files.

420. The full schedule for the auction process is included in the *Table of Key Dates* on page iii of this Framework, and on Industry Canada's Spectrum Management and Telecommunications website at <http://www.ic.gc.ca/spectrum>.

10. Post-auction Licensing Process for Unassigned Licences

421. Industry Canada will make unassigned licences available for licensing through an alternative process, which could include a subsequent auction at a later date following the close of the initial auction. The timing and form of such a process will depend on the demand for the available licences. Industry Canada may conduct a public consultation should it consider it necessary.

11. Licence Renewal Process

422. Industry Canada sought comments on its proposed licence renewal process.

Summary of Comments

423. WIND and SSi agreed with the renewal process as proposed by Industry Canada.

424. MTS Allstream suggested that the renewal process begin five years prior to the end of the licence term, whereas TELUS suggested that a separate public consultation be conducted at the earliest opportunity with respect to annual licence fees for mobile spectrum.

425. Bell and Rogers commented that licensees should have a “high expectation of renewal” not only in the initial licence term, but in all subsequent licence terms.

Discussion

426. Industry Canada considers that a public consultation on licence renewal is better conducted towards the end of the licence term, as this results in a more accurate assessment of: the licensees’ compliance with the conditions of licence; the general environment (e.g. use of the band by other licensees and international developments); and the demand for spectrum from other parties.

427. On the issue of the high expectation of renewal for subsequent licences, as noted in the FSAC, spectrum licences have a high expectation of renewal under certain circumstances. An assessment of whether these circumstances exist is better assessed during the consultation on the licence renewal process.

Decision

428. Based on the above considerations, the licence renewal process will apply as proposed:

429. Following the end of the initial licence term, licensees will have a high expectation of renewal. New licences will be issued for a subsequent term through a formal renewal process unless the Minister determines that a breach of licence condition has occurred, a fundamental reallocation of the spectrum to a new service is required, or an overriding policy need arises. In the absence of the previously outlined determinations, the renewal process facilitates the continued provision of services by existing licensees.

430. As part of the licence renewal process, the Minister of Industry retains the power to fix the new terms and conditions of spectrum licences and to amend these during the new term of the licence and in accordance with subsection 5(1) of the *Radiocommunication Act*. As noted in the FSAC, licence fees that reflect some measure of market value will apply to licences issued through a renewal process. Accordingly, the renewal process will serve to determine whether new licences will be issued, the terms and conditions that will apply to the new licences and the applicable licence fees.

431. Generally, approximately two years prior to the end of the licence term, Industry Canada will review whether there is a need for a fundamental reallocation of the spectrum to a new service, or whether an overriding policy need has arisen. A review of the licensee's continued compliance with the conditions of licence will also begin. Industry Canada will launch a public consultation to discuss whether or not, in light of the above-noted issues, new licences should be issued for a subsequent term. The consultation paper will also propose, and invite comments on, licence conditions and fees that would apply during the subsequent licence term.

432. For long-term spectrum licences, Industry Canada's assessment of a licensee's eligibility for a subsequent licence term will generally be comprised of, among other factors: a review of the licensee's continued compliance with all conditions of licence, including any deployment requirements; a scan of the general environment (e.g. use of the band by other licensees and international developments); and an assessment of the demand for spectrum from other parties.

12. Clarification Process — Amendments and Supplements

433. Industry Canada may also amend or supplement the auction rules and procedures contained in this Framework. Any such amendment or supplement will be published on Industry Canada's Spectrum Management and Telecommunications website and will be sent to all qualified bidders.

434. For a limited period of time, Industry Canada will accept written questions seeking clarification of the rules and policies set out in this Framework. Written questions asking for clarification of rules or policies will be accepted until the deadline specified in the Table of Key Dates on page iii of this Framework. Every effort will be made to post the questions received, along with Industry Canada's written responses, in the shortest time frame possible, depending on the volume of the questions received. Questions and responses that are of a similar nature and subject matter may be grouped and summarized. Questions regarding bidding procedures or the functionality of the software will be addressed during the information session and in mail-out packages intended for qualified bidders, and will not be included in this clarification process, unless they are deemed to be critical information for potential bidders at this point in time. These answers will be considered as clarification of the policies set out in SMSE-002-12, *Policy and Technical Framework: Mobile Broadband Services (MBS) – 700 MHz Band, Broadband Radio Service (BRS) – 2500 MHz Band*, and as amendments or supplements to the rules set out in this Framework.

435. Questions should be submitted in electronic format (WordPerfect, Microsoft Word or Adobe PDF) to the following e-mail address: spectrum.auctions@ic.gc.ca.

436. Written questions should be addressed to the Manager, Auction Operations, Spectrum Auction Branch, Industry Canada, 300 Slater Street, Ottawa, Ontario K1A 0C8.

437. All questions should cite the *Canada Gazette*, Part I, the publication date, the title and the notice reference number (DGSA-001-13). Questions and responses will be posted on Industry Canada's Spectrum Management and Telecommunications website at <http://www.ic.gc.ca/spectrum>.

13. Obtaining Copies

438. All spectrum-related documents referred to in this paper are available on Industry Canada's Spectrum Management and Telecommunications website at <http://www.ic.gc.ca/spectrum>.

439. For further information concerning the process outlined in this Framework or related matters, contact:

Manager, Auction Operations
Spectrum Auction Branch
Industry Canada
300 Slater Street, 17th Floor
Ottawa, Ontario K1A 0C8
Telephone: 613-957-8106
Fax: 613-949-7667
E-mail: spectrum.auctions@ic.gc.ca

Annex A – Glossary of Auction Related Terms

Term	Definition
Activity rule	A rule that limits what bids a bidder can make in subsequent rounds of a multiple round auction. The activity rules are intended to avoid bid sniping and to encourage truthful bidding.
Aggregate demand	The total number of bids on a product.
Allocation stage	A stage of the combinatorial clock auction in which the number of spectrum licences that a bidder wins in each service area, as well as the base price for these licences, is determined.
Assignment price	The price for specific licences that a winning bidder has won in the assignment stage.
Assignment stage	A stage of the auction in which bidders that have won generic licences are assigned specific licences.
Base price	The price for a package of licences that a winning bidder has won in the allocation stage. The base price is calculated at the end of the allocation stage. It does not include the assignment price.
Bid amount	The price that a bidder bids for a particular licence or package of licences.
Bid shading	The strategy of bidding below one's valuation, typically as a way to improve profits in first-price auctions.
Bid sniping	The tendency for a bidder to wait until the last possible opportunity to place a serious bid. Auctions often have activity rules in place to prevent bid sniping.
Category	A spectrum block or group of spectrum blocks with similar properties. A category can include a single licence for each service area or a group of generic licences for each service area.
Clock price	A price for a product in a clock round.
Clock round	A round in the allocation stage of the auction in which bidders can submit a bid for a single package of licences in response to prices announced by Industry Canada.
Complementary goods	X and Y are complementary goods if the demand for X decreases when the price of Y increases. Complementary goods are typically purchased together and are more valuable together than they are apart (the sum is greater than the parts). The complementarities may be strong or weak. The level of complementarities between goods is important in designing an auction.
Demand reduction	A situation where a bidder reduces its demand to keep prices low.
Efficient	The assignment of the licences to the bidders that value them the most.

Term	Definition
assignment/outcome	
Eligibility-based activity rule	An activity rule based on eligibility points where a bidder cannot bid on a package of licences for which the sum of the eligibility points for these licences exceeds the bidder's current eligibility points. A bidder's initial level of eligibility is based on its pre-auction financial deposit. In subsequent rounds, its number of eligibility points is set by the bids placed in the previous round (and the activity percentage for that round).
Eligibility points	Each licence is assigned a certain number of eligibility points that are related to its population, bandwidth and estimated value. They are first used in the determination of the pre-auction deposit, and then for the eligibility-based activity rule. A bidder's initial eligibility points define the upper limit of licences for which the bidder can bid (based on the sum of bidding points associated with the licences in its bid).
Eligibility-reducing round	A clock round in which the number of eligibility points associated with a bid is less than the bidder's eligibility. In subsequent rounds, the bidder's eligibility is reduced.
Excess demand	The extent to which the aggregate demand exceeds the number of licences available.
Exposure risk	The risk of winning only some licences in a collection of licences that a bidder wants. This may occur when bids are treated individually instead of being treated as a package.
Final clock package	The package that the bidder bid on in the final clock round.
First-price rule	A pricing rule which requires winning bidders to pay the full amount of their winning bid.
Gaming or game playing	Bidding in an auction in a way that does not truthfully represent the bidder's true valuation of the spectrum, but may increase the bidder's chances of a favourable outcome. Examples of gaming include demand reduction, parking and tacit collusion.
Generic licences	Licences that are similar enough and of comparable value such that they can be offered together in a single category. Bidders may then express a demand for a number of generic licences at a particular price.
Lost licence	As part of a tie resolution mechanism in the allocation stage, a licence that was included in a bidder's final clock package, but that is not included in an alternate package that could be assigned to the bidder.
Opening bid prices	Opening bid prices are the starting prices for the spectrum licences in the auction, and the minimum that Industry Canada will accept for each licence.
Package bid	A package bid is a bid on a set of licences.

Term	Definition
Parking	A strategy in which bidders bid on licences that they do not expect to win simply to maintain greater eligibility for later in the auction.
Pre-auction financial deposit	A pre-auction financial deposit that Industry Canada requires all bidders to submit with their application to participate in the auction. The deposits are based on the licences on which the applicant wishes to be eligible to bid.
Price discovery	A feature of multiple round auctions in which bidder demands and prices are reported to bidders, giving them the opportunity to adjust subsequent bids based on the information.
Pricing rule	The rule that determines the price to be paid by the bidder.
Product	A category in a given service area.
Revealed preference activity rule	An activity rule based on prices and bidding activity in previous rounds. The rule allows a bidder to shift toward larger packages, in terms of associated eligibility points that have become relatively less expensive.
Second-price rule	A pricing rule that requires winning bidders to pay an amount that is sufficient to ensure that no other bidder, or group of bidders, was prepared to pay more than the winning bidders for the licence(s) in question.
Service area	<p>Industry Canada has established four tiers of service areas, which it uses for competitive licensing. These areas cover the entire geography of Canada and are based on Statistics Canada's Census Divisions and Subdivisions. The definition of the service areas within these tiers and accompanying maps and data tables are available on Industry Canada's website. See Service Areas for Competitive Licensing at http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01627.html.</p> <p>For the 700 MHz auction, licences will be auctioned using Tier 2 service areas for all frequency blocks.</p>
Specific licence	Licences that are treated individually, each with its own characteristics. Specific licences are appropriate when each licence has unique characteristics that determine its value.
Substitute goods	X and Y are substitute goods if the demand for X increases when the price of Y increases. Consequently, a bidder may wish to switch its bid from the more expensive good (Y) to the less expensive good (X) when the price of Y increases, as the two goods are deemed similar enough.
Substitution	The act of shifting demands across products or packages in response to price changes, increasing the demand of the product that has become relatively more attractive as a result of the price change.
Supplementary bid	A bid placed for a single package in the supplementary round.

Term	Definition
Supplementary round	A single round that occurs after the clock rounds end in a combinatorial clock auction (CCA). Bidders are able to bid on multiple packages in the supplementary round, either submitting bids for new packages or improving their bids for packages that they bid for in the clock rounds.
Tacit collusion	Cooperative behaviour among bidders whereby they do not engage in any explicit communication and do not enter into any explicit agreement, but in some manner attempt to coordinate on a better joint outcome than would be attained by purely competitive bidders.
Valid bid	A bid that is accepted by the auction system.
Winner determination	The process of determining winning bids and prices to be paid using an algorithm.

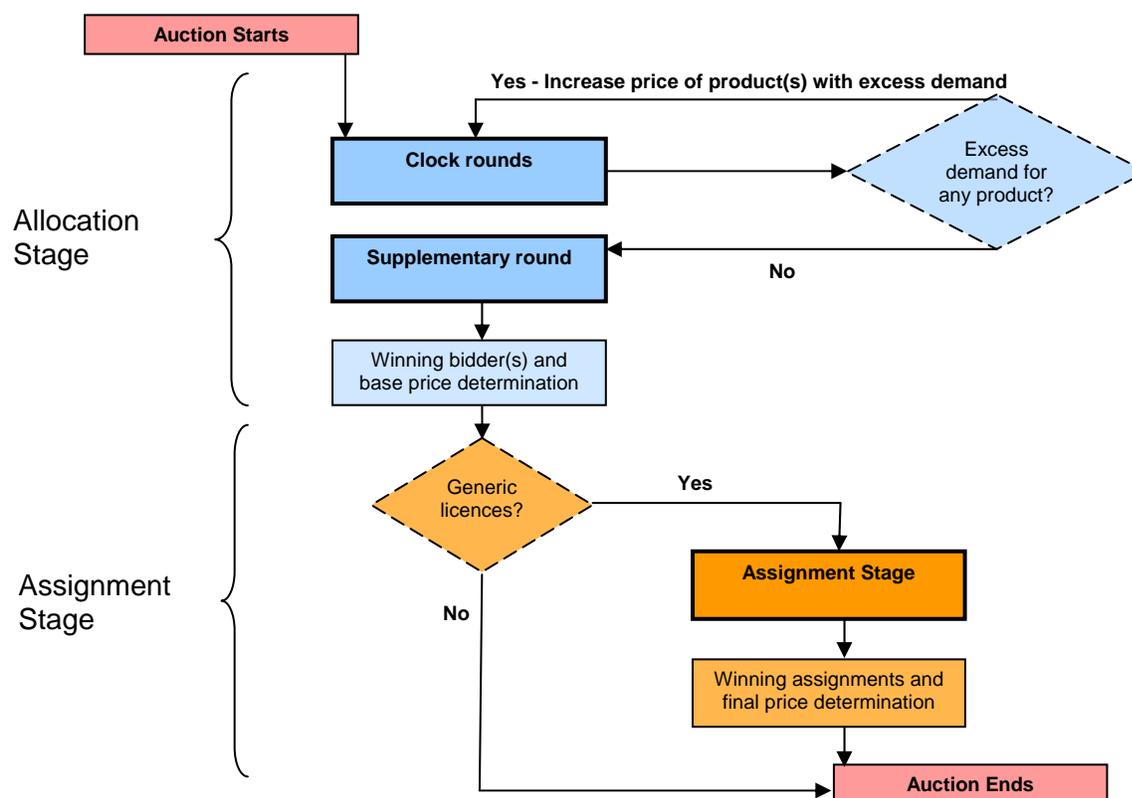
Annex B – The Combinatorial Clock Auction (CCA) Format

1. Industry Canada will use a combinatorial clock auction (CCA) format for the 700 MHz licensing process. A CCA involves a bidding process that includes a price discovery stage, which is similar to the simultaneous multiple round ascending (SMRA) auction format. However, the CCA format also has attributes which remove or reduce some design concerns associated with the SMRA auction format. In particular, in a CCA, bidders are able to bid on packages of licences instead of individual ones, eliminating the risk that bidders may win some but not all of the licences that they desire. This is particularly important given the regional nature of the licences to be auctioned and the complementarities that exist between these licences.

2. Generic licences and anonymous bidding are other features that will be used in the 700 MHz auction. Generic licences are blocks of spectrum that are similar in terms of frequency location in the band, block size, technology and interference constraints and are of comparable value, such that they can be grouped together in a “single category” for bidding purposes in the auction. The use of generic licences will decrease bidding complexity by reducing the number of categories available to bid on in the auction, and will enhance substitution among licences. The use of anonymous bidding will reduce the potential for gaming. Pricing rules and activity rules that encourage truthful bidding throughout the auction process, i.e. bidding in a manner that is consistent with how a bidder truly values the package, will further improve the process.

1. Overview of the CCA

3. A CCA is comprised of two stages, the allocation stage and the assignment stage (Figure 1). In the allocation stage, the number of spectrum licences that a bidder will win in each service area and the base price to be paid by each winning bidder are determined. Where generic licences are offered, an additional stage is needed to determine the specific frequencies that will be assigned to each winning bidder. This stage is referred to as the assignment stage.

Figure 1: CCA Process

2. The Allocation Stage

4. The allocation stage of the auction determines the winning bidders and the number of licence blocks that they have won. The allocation stage is divided into two phases: the clock rounds and the supplementary round. All valid bids submitted during both phases of the allocation stage are used to determine the winning packages and base prices.

5. The clock rounds allow for price discovery, helping to reduce a bidder's uncertainty regarding the value of the licences. Bidders are able to respond to the changes in prices accordingly, shifting their bids to licences that continue to be consistent with their business objectives.

6. During each clock round, bidders are only able to bid on one package of licences; however, there may be other packages that they would be interested in winning. The supplementary round provides bidders with an opportunity to improve bids that they placed in the clock rounds and/or to submit bids for packages that they were eligible to bid on but unable to submit in the clock rounds.

7. There is a spectrum cap of two blocks of paired spectrum in each service area. Therefore, bidders will be unable to bid on more than two licences of paired spectrum in each service area. Large wireless service providers are further limited in that they can only bid on one paired licence in each service area among blocks B, C, C1 and C2. This cap on large wireless service providers does not, however, include block A. (It should be noted that large wireless service providers are defined as companies with 10% or more of the national wireless subscriber market share, or 20% or more of the wireless subscriber market share in the province of the relevant licence area. The subscriber market share for Ontario will apply for the licence area 2-06, Eastern Ontario and Outaouais. For the Tier 2-14 licence area (Yukon, Northwest Territories and Nunavut), only the national market share criteria will apply.)

3. Clock Rounds

8. The allocation stage begins with the clock rounds. Licences or sets of generic licences (substitutable licences of comparable value) are defined prior to the auction, and are separate categories in each service area in the auction.

9. For the 700 MHz auction, there will be four categories of licences in each of the 14 service areas:

- block A in the lower 700 MHz band (one licence of 6+6 MHz)
- blocks B and C in the lower 700 MHz band (two generic licences of 6+6 MHz)
- blocks D and E in the lower 700 MHz band (two generic licences of 6 MHz)
- blocks C1 and C2 in the upper 700 MHz band (two generic licences of 5+5 MHz)



10. A category in a given service area is referred to as a product. Given that there will be four categories of licences in each of the 14 service areas, there will be 56 products (4 x 14) in the 700 MHz auction.

11. The licences are auctioned simultaneously over multiple clock rounds. In each round and for each product, bidders indicate the number of licences in each product on which they would like to bid given the prevailing prices. For a product in any of the categories containing two generic licences, the bid is “0,” “1” or “2.” For a product in the block A category, which contains only one licence, the bid is “0” or “1.” All of the individual bids placed by a bidder in a given round are considered to be a single package bid, creating an all-or-nothing bid. The price of the package bid is equal to the sum of the bids for individual products, evaluated at the prevailing clock prices.

12. When there is excess demand for a product, its price increases in the next round. There is excess demand for a product when the number of licences that are bid for exceeds the number of licences available.

13. To remain in the auction, a bidder must submit a valid bid with a value greater than zero for at least one licence in the first clock round. This bid cannot be withdrawn and will be part of the bids considered in determining the assignment of licences at the end of the allocation stage. The last valid bid submitted during each clock round is binding and will be considered in determining both winning packages and base prices after the supplementary round ends.

14. Bidding remains open in the clock rounds on all products until there is no excess demand for any of the products.

4. Conclusion of Bidding in the Clock Rounds

15. The clock rounds end when there is a round in which there is no excess demand for any of the products. This round is referred to as the final clock round. The package on which a bidder placed a bid in the final clock round is referred to as its final clock package. At this point, Industry Canada will announce that the clock rounds have ended and that the auction will proceed to the supplementary round (see Section 9 of this annex).

5. Information in the Clock Rounds

16. Before the start of each clock round, each bidder will receive information regarding its own bids from the previous round and the number of eligibility points that it will have in the next round. In addition, all bidders will be informed of the aggregate demand for each product from the previous round and the prices for each product in the next round. Bidders will not be informed about the individual bids submitted by other bidders or the remaining eligibility of other bidders. In addition, information about the aggregate demand from the final clock round will be withheld until the end of the auction.

6. Bid Increments

17. In the first clock round, the price of each licence will be equal to the opening bid price listed in Table 3 in Section 4.2 of the Framework.

18. During subsequent clock rounds, if there is excess demand for a given product, the price of the given product will increase in the next round. Industry Canada will use activity-based increments where the increment for each product is based on the level of excess demand for the product during the previous clock round. Products that generate greater excess demand are subject to a larger bid increment than products that generate less excess demand. Prices will increase more quickly for products with higher demand, potentially shortening the length of the auction. If there is no excess demand, the price of the product will not increase in the next clock round.

19. The bid increments for the 700 MHz auction will be in the range of 1-20% of prices in the previous clock round (rounded to the nearest thousand). Further information on the calculation of bid increments will be published in the information package provided to qualified bidders.

7. Eligibility Points

20. Each of the 98 licences has been assigned a specific number of eligibility points (points) that are related to the population covered by the licence, its bandwidth and the estimated value of the spectrum. Generally, one point has been assigned per 5 MHz of spectrum per 100,000 in population count. The five service areas of Southern Quebec, Eastern Ontario and Outaouais, Southern Ontario, Alberta and British Columbia are the exception. For these five service areas, the eligibility points per paired spectrum block have been adjusted in proportion to the opening bid prices. Section 4.3 of the Framework lists the eligibility points associated with the paired and unpaired blocks of spectrum being auctioned, as well as the population of their respective service areas.

21. Eligibility points are used in the determination of the pre-auction financial deposits and in the activity rules during the auction, influencing the bids that bidders can submit. In their application, each potential bidder must indicate the total number of “points” worth of licences on which they wish to bid. This number defines a bidder’s initial level of eligibility points and, hence, the maximum number of licences that a bidder is eligible to bid on at the start of the auction.

22. Bidder eligibility points cannot be increased once the auction has started.

8. Activity Rule in the Clock Rounds

23. An activity rule has been established to encourage truthful bidding throughout the clock rounds. This facilitates the price discovery process, allowing bidders to make changes to their bidding strategies dynamically throughout the auction, in response to increasing prices. The activity rules discourage a bidder from misrepresenting its true demand, as doing so will limit the bidder’s ability to bid on what it really wants later in the auction.

24. A revealed preference/eligibility point hybrid activity rule will be used for each clock round. It comprises both an eligibility-based activity rule and a revealed preference activity rule.

25. The eligibility-based activity rule is similar to the rule that has been used in previous SMRA auctions. Bidders begin each clock round with a set number of eligibility points and these determine the maximum activity level for that clock round. For example, a bidder with 100 eligibility points can bid on licences whose total sum of associated points is 100 or less.

26. The eligibility point activity requirement for the 700 MHz auction is 100%. Specifically, in each round, a bidder is required to bid on licences whose total sum of associated points is equal to 100% of its eligibility points if it wishes to maintain that eligibility level in the subsequent round.

27. The eligibility-based activity rule considers the size of the package that the bidder is bidding on, where size is the sum of the eligibility points for each licence in the package. The eligibility-based activity rule requires bidders to bid on packages of the same size or smaller as prices rise. When a bidder switches to a package that is smaller than the package that it has previously bid on, (that is, has fewer eligibility points worth of licences), the bidder’s eligibility is reduced. A clock round in which a bidder’s eligibility is reduced is called an *eligibility-reducing round*. These rounds play a special role in the activity rules of the 700 MHz auction.

28. Bidders are required to have eligibility points to bid during the clock rounds. If a bidder's eligibility drops to zero during the clock rounds, the bidder will no longer be able to bid in the clock rounds, but will be able to bid in the supplementary round provided that it placed at least one valid bid with a value greater than zero during the clock rounds.
29. However, there are some shortcomings with using only the eligibility-based activity rule. Price discovery might be lessened, as there is an incentive for bidders to choose only larger packages when prices are low, rather than a package that may work better for them, so that they maintain a higher number of eligibility points for later in the auction. Furthermore, an eligibility-based activity rule may prevent a bidder from making a desirable substitution to a package that is larger in terms of associated eligibility points, but which has become relatively less expensive. In such a case, the eligibility-based activity rule would prevent the bidder from bidding on its most preferred package.
30. A revealed preference activity rule will lessen these problems, as it allows bidders to exceed their eligibility points in order to bid on packages that have become comparatively less expensive. Revealed preference refers to the information that a bidder discloses regarding its inclination toward one package versus another. In particular, if a bidder chooses one package over another given a certain price differential between the two packages, then the bidder should always choose the same package given the same price differential.
31. For example, suppose that a bidder desires either a smaller package, X, or a larger package, Y, but not both. At the current prices, X is preferred, but in subsequent rounds, the prices for the licences in X increase much faster than the prices for the licences in Y. As a result, the bidder prefers Y to X at the new prices. The revealed preference activity rule allows the bidder to switch from X to Y because Y is now the better value. In contrast, the eligibility point rule would not allow the switch because Y is larger than X. This example illustrates the problem with using the eligibility-based activity rule exclusively and the advantage of using the eligibility-based activity rule in combination with the revealed preference activity rule.
32. However, bidding on a larger package will not increase the bidder's eligibility in subsequent rounds. Furthermore, a bidder will never be able to bid on a package with associated eligibility points exceeding the bidder's initial eligibility. For an algebraic description of the revealed preference activity rule in the clock rounds, see Annex D. For an example of the revealed preference activity rule in the clock rounds, refer to Annex C.
33. Using both an eligibility-based activity rule and a revealed preference activity rule will provide extra flexibility to the bidder. A bidder can continue to bid just as it would under the eligibility-based activity rule. In addition, the bidder is given some extra flexibility to bid on a larger package provided that the larger package has become relatively less expensive, providing more opportunity for bidders to adjust their bids in response to information received in the clock rounds.

9. Supplementary Round

34. The second phase of the allocation stage is the supplementary round. The supplementary round is a single round process in which bidders have the opportunity to place additional bids on packages, subject to constraints that are based on the bids that they placed in the clock rounds (see Section 10 of Annex B). These additional bids could be used to improve bids on packages previously submitted in the clock rounds and/or to submit bids for which they were eligible to bid on, but unable to submit in the clock rounds.

35. In the clock rounds, a bidder is allowed to bid on only one package of licences per round. As there may be other packages that a bidder would be interested in winning, the supplementary round provides bidders with an opportunity to place their best and final bids on packages that they were willing and eligible to bid on in the clock rounds, but did not necessarily bid on. These supplementary bids are critical in ensuring that the licences are allocated to the bidders who value them the most and that winning bidders pay an amount that is sufficient to ensure that no other bidder or group of bidders was willing to pay more for the licences.

10. Activity Rule in the Supplementary Round

36. The activity rule in the supplementary round encourages truthful bidding throughout the allocation stage of the auction and ensures that supplementary bids are consistent with preferences expressed in the clock rounds.

37. Any bidder that placed at least one valid bid with a value greater than zero in the clock rounds may submit bids in the supplementary round. However, a bidder is not required to submit bids in the supplementary round.

38. All licences are available for bidding in the supplementary round, so that bidders can improve on bids submitted during the clock rounds or submit bids for packages of licences that they did not bid on in the clock rounds.

39. A bidder can only make one supplementary bid for a given package of licences. The limit on the number of different supplementary round packages that a bidder will be allowed to place will be announced after the bidder qualification has occurred, but will be no less than 500 different packages. A bidder will not be permitted to make a supplementary bid on a package comprising no licences.

40. The bid amount for a supplementary bid must be at least the sum of the opening bid prices for all the licences included in the package. Furthermore, if a bidder submitted a bid on a certain package in the clock rounds, the supplementary bid amount must be greater than the bidder's highest bid for that package.

41. Each bid in the supplementary round must satisfy the following revealed preference activity rule.

42. *Revealed Preference Limit:* There is no limit on the supplementary bid amount for the final clock package, which is the package that the bidder bid on in the final clock round. All other supplementary bids must satisfy revealed preference with respect to the final clock round, regardless of whether the supplementary bid package is worth more or less eligibility points than the bidder's eligibility in the final clock round.

43. In addition, supplementary bids for packages that exceed the bidder's eligibility in the final clock round must satisfy revealed preference with respect to each eligibility-reducing round, beginning with the last round in which the bidder had sufficient eligibility to bid on the package. The application of the revealed preference limit could have the effect of creating a chain of constraints on the dollar amount of a supplementary bid relative to the dollar amount of other supplementary bids.
44. The revealed preference limit with respect to the final clock package provides the bidder with an incentive to bid on the most preferred package throughout the clock rounds. This is because supplementary bids are limited by bids submitted in the clock rounds. Given that the bidder does not know which round will be the final clock round, the bidder will be motivated to always bid truthfully to improve its chance of winning its most preferred package; otherwise, the bidder will be constrained in the supplementary round.
45. *Non-disclosure of aggregate demand*: At the end of the final clock round, the aggregate demand from the final clock round will not be provided to bidders.
46. This activity rule provides the strongest incentive for truthful bidding during the supplementary round, encouraging bidders to bid based on their valuations rather than on any expected guarantee of winning their final clock package. The structure of the supplementary round bidding constraints guarantees that the final clock allocation will not change if there are no unallocated licences. If there are unallocated licences, each bidder will be allocated its final clock package if it has submitted a supplementary bid that increases the dollar amount of its final clock package by at least the value of the unallocated licences as evaluated at the final clock prices less the opening bid prices of the unallocated licences. However, as the aggregate demand in the final clock round will not be available to bidders as they go into the supplementary round, bidders will not know the exact amount that they need to bid to ensure that they win their final clock package, encouraging bidders to bid truthfully on the packages that are of interest to them. Furthermore, the ability to ensure this allocation may be compromised if any other supplementary bid does not include, at a minimum, all of the licences contained in the bidder's final clock package.
47. Further information on the process for submitting supplementary bids will be available in the information package provided to qualified bidders.

11. Determining the Winning Packages in the Allocation Stage

48. All valid bids received from bidders in the clock rounds and in the supplementary round are considered for the determination of winning packages. In addition, a reserve bid for every licence, at the opening bid price, will be included in the determination of winning bidders at the end of the allocation stage. In this process, it is as if Industry Canada is a bidder in the auction, placing a bid on every licence at the opening bid price. The purpose of including a reserve bid for every licence is to ensure that the incremental value that a bidder would be prepared to pay for an additional licence is at least the opening bid price of that licence. The reserve bids will not be treated as a package, but rather as having been placed by different bidders so that any number of reserve bids can be selected in the winning combination.

49. A solver will be used to identify the highest value combination of valid bids subject to the requirements that each bidder wins no more than one of its packages and that each licence is allocated no more than once. If there is only one combination of bids that meets the criteria, this will be the winning outcome that determines the winning packages and winning bidders. For details, see *Mathematical Formulations for Winner and Price Determination in the Combinatorial Clock Auction for Mobile Broadband Services (MBS) – 700 MHz Band* (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08697.html>).

50. If there is more than one combination of valid bids having the same highest value, the tie will be resolved first, by minimizing the number of “lost licences,” where a lost licence is a licence that was included in the bidder’s final clock package, but is not included in an alternate package that could be assigned to the bidder. The rationale for selecting the combination of valid bids that minimizes the number of lost licences as the first tie-breaking rule is to select an assignment that is the most similar to the final clock allocation.

51. If there is still a tie, the second tie-breaking rule is to select the combination of valid bids that includes the greatest number of associated eligibility points. **Note:** If reserve bids are part of the winning combination, the eligibility points associated with the reserve bids will not count towards the eligibility points of the winning combination. This is to maximize the quantity of spectrum that is allocated. If, subsequently, there is still a tied outcome, the tie will be broken by a pseudo-random number generator built into the auction software.

12. Determining the Base Price in the Allocation Stage

52. The base price is the minimum amount that the winning bidders will pay for their generic winning packages; it does not include the additional, incremental amount that winning bidders may pay for specific licences as determined in the assignment stage should there be generic licences included in the winning allocation stage package. The base price is determined using all valid bids submitted by all bidders during the allocation stage.

53. Industry Canada will use a second-price rule to calculate the base prices such that winning bidders, individually and collectively, will pay an amount that is sufficient to ensure that there is no other bidder or group of bidders prepared to pay more for the licences. This amount is typically less than the actual winning bid submitted in the allocation stage, either in the clock rounds or the supplementary round, and must be greater than or equal to the total sum of the opening bid prices for the combination of licences included in their winning package. The benefit of using a second-price rule is that it encourages bidders to bid truthfully, potentially leading to a more efficient outcome.

54. Industry Canada will apply bidder-optimal core prices and use the “nearest Vickrey” approach to determine the base prices. In some cases, the second price (Vickrey price) may not be high enough to ensure that there is no alternative bidder or group of bidders prepared to pay more for the licences in question, and so an additional payment above Vickrey prices is required. In the event that such a payment is required, the portion of the additional payment to be paid by each winning bidder will be weighted based on the winning package sizes evaluated at the opening bid prices. Further information on the determination of base prices can be found in Annex E.

13. Information at the end of the Allocation Stage

55. At the end of the allocation stage, after the results have been verified, each bidder will be informed of its own winning packages, along with the base price to be paid for its package.

56. At this point, bidders will know with certainty the number of licences in each product that they have won; however, where there are generic licences, they will not necessarily know the specific licences that they have won.

14. The Assignment Stage

57. As there are generic licences, the auction will then advance to the assignment stage, where the specific assignment of the generic licences will be determined. Only bidders that have won one or more generic licences during the allocation stage will have the option to participate in the assignment stage.

58. Industry Canada will run three sequential assignment rounds (i.e. one for each category of generic licences): blocks B and C; blocks D and E; and blocks C1 and C2. This is to allow bidders that have won licences in the same category of generic licences across multiple service areas to express their preference for particular licences.

59. In each assignment round, winning bidders are allowed to submit multiple top-up bids for the specific licence(s) that they most prefer in each service area, using a single round process for each category. Each bid reflects the incremental value that the bidders place on winning these particular frequency blocks.

60. Winning bidders do not have to place bids in the assignment stage if they do not have an assignment preference, as they are guaranteed the number of generic licences that they have already won. However, a bidder is not guaranteed to win the same block across all service areas and risks winning different specific licences in different service areas if it does not submit any assignment bids, as each winning bidder has both a right and an obligation to purchase one of the licences in each product presented to it in the assignment round(s).

61. For example, in the 700 MHz auction, if two bidders each win a licence in the C1 and C2 category in a given service area, then each will have an opportunity to submit an additional bid for either the C1 or the C2 licence, depending on its preferred assignment. However, if one of the two bidders does not have a preference between the two licences, it does not have to submit assignment bids.

62. A solver will be used to identify the combination of specific assignments of licences that result in the highest bid amount subject to the assignment stage restriction (see Section 15 of this annex). In the event of a tied outcome with more than one specific assignment producing the same total value, the tie will be broken by a pseudo-random number generator built into the auction software.

63. Similar to the determination of base prices in the allocation stage, a second-price rule will be used to determine the assignment price to be paid for the assignment of specific licences such that winning bidders will pay an amount sufficient to ensure that there is no other bidder or group of bidders prepared to pay more for the licence(s).

64. The additional amount to be paid for the assignment of specific licences, known as the assignment price, is calculated for a package of licences within one category, not the individual licences. In general, given the pricing rules, the assignment price of each winning assignment stage bid will be equal to or less than the corresponding winning bid amount; however, it is likely that it will be less than the winning bid amount and could even be zero.

65. Industry Canada will apply bidder-optimal core prices and use a “nearest Vickrey” approach to determine assignment prices. In the event that an additional payment above Vickrey prices is required, the portion of the additional payment to be paid by each winning bidder will be weighted based on the winning package sizes evaluated at the opening bid prices. Further information on the determination of assignment prices can be found in Annex E.

15. Restrictions in the Assignment Stage

66. The assignment options will be limited such that where a bidder wins block A and one of blocks B and C in a given service area, then the bidder will automatically be assigned blocks A and B in that service area.

67. Further information on the process for submitting assignment round bids will be available in the information package provided to qualified bidders.

16. Information at the end of each Assignment Round

68. Following the end of each assignment round, after the results have been verified, participating bidders will be notified of the specific licences that they have won and the assignment price to be paid. This will allow bidders who have won licences across multiple categories to know their own results from one assignment round before participating in a subsequent assignment round.

17. Final Price

69. Following the determination of the winning assignment bids, Industry Canada will determine the final price to be paid by each winning bidder. The final price to be paid by a winning bidder is equal to the base price plus any associated assignment prices for a bidder’s winning package.

18. Information at the end of the Assignment Stage

70. Following the end of the assignment stage, winning bidders will be notified of the specific licences that they have won, as well as the final price to be paid.

19. Information at the end of the Auction

71. The following information will be made publicly available following the conclusion of the auction:

- the list of winning bidders, licences won and prices to be paid;
- the bids submitted by each bidder in every clock round, including their identity;
- the supplementary bids submitted by each bidder, including their identity; and
- the assignment bids submitted by each bidder, including their identity.

Annex C – Example of the Activity Rules

1. For the purposes of this example, only a single service area and two categories within the 700 MHz band will be considered: blocks C1/C2 and blocks D/E. Within the given service area, suppose that each C1/C2 licence has an eligibility of 50 points, whereas each D/E licence has an eligibility of 25 points.
2. A single bidder, Bidder A, will also be considered. Bidder A would like to obtain two C1/C2 licences. This package will be denoted as (2, 0). However, if the price of the package with two C1/C2 licences exceeds the price of a package with one C1/C2 licence and one D/E licence by more than \$500,000, then Bidder A would prefer a package with one C1/C2 licence and one D/E licence, denoted as package (1, 1).
3. Eventually, if the prices become too high, Bidder A will be unable to afford two licences and will need to reduce its demand to one licence. In this case, Bidder A again prefers one licence from C1/C2, but will switch to one D/E licence if the price of one C1/C2 licence, denoted as package (1, 0), exceeds the price of one D/E licence, denoted as package (0, 1) by more than \$500,000.
4. Bidder A's total budget is \$2,800,000. If the price of obtaining two licences becomes greater than this, Bidder A must reduce its demand to one licence.

Round 1

5. In Round 1, the opening bid prices are announced; the opening bid price for blocks C1/C2 is \$1,000,000 per licence, and for D/E, it is \$600,000 per licence. The price of a package with two C1/C2 licences is \$2,000,000, whereas the price of a package with one C1/C2 licence and one D/E licence is \$1,600,000 (a price difference of \$400,000). As Bidder A prefers two C1/C2 licences unless the price difference is greater than \$500,000, Bidder A will bid on two C1/C2 licences, package (2, 0):

Category	Price	Bid	Eligibility Points
C1/C2	\$1,000,000	2	100
D/E	\$600,000	0	0
Total Package	\$2,000,000	(2, 0)	100

Round 2

6. In Round 1, several other bidders shared Bidder A's preference for C1/C2, whereas few bidders bid on D/E. As a result, the prices in Round 2 are \$1,200,000 for C1/C2 and \$650,000 for D/E. The price of a package with two C1/C2 licences is \$2,400,000, whereas the price of a package with one C1/C2 licence and one D/E licence is \$1,850,000 (a price difference of \$550,000). As Bidder A prefers one C1/C2 licence and one D/E licence when the price difference is greater than \$500,000, Bidder A now bids on one licence from each category, package (1, 1), thereby reducing eligibility from 100 to 75 points.

Table 2 — Round 2			
Category	Price	Bid	Eligibility Points
C1/C2	\$1,200,000	1	50
D/E	\$650,000	1	25
Total Package	\$1,850,000	(1, 1)	75

Round 3

7. In Round 2, the low price of D/E caused many bidders to switch demand to that category. As a result, the price of D/E increased at a faster rate than the price of C1/C2. The Round 3 prices are \$1,250,000 for C1/C2 and \$800,000 for D/E. The price of a package with two C1/C2 licences is \$2,500,000, whereas the price of a package with one C1/C2 licence and one D/E licence is \$2,050,000. This price difference is only \$450,000, so Bidder A would prefer to switch back to bidding on two C1/C2 licences, package (2, 0).

8. Using only an eligibility point activity rule, switching back at this point would be impossible because Bidder A would no longer have enough eligibility to bid on a package worth 100 points. This limitation could have the effect of creating a disincentive for Bidder A to bid on its most favourable package in Round 2. Bidder A would have needed to bid on a less profitable package in order to maintain its eligibility for as many rounds of the auction as possible.

9. With a revealed preference/eligibility point hybrid activity rule, however, Bidder A is free to switch back as long as the package satisfies revealed preference with respect to each prior eligibility-reducing round:

Table 3 — Round 3			
Category	Price	Bid	Eligibility Points
C1/C2	\$1,250,000	2	100
D/E	\$800,000	0	0
Total Package	\$2,500,000	(2, 0)	100 (Eligibility is 75)

10. In order to place a bid with eligibility points greater than its current eligibility (75 points), Bidder A must meet the revealed preference constraint with respect to each prior eligibility-reducing round. In this case, the only eligibility-reducing round is Round 2, where Bidder A decreased its eligibility from 100 points to 75 points. In other words, in order for Bidder A to be able to switch its bid from (1, 1) to (2, 0), the (2, 0) package had to become relatively cheaper than the (1, 1) package. Mathematically, the revealed preference constraint is stated as follows, where R refers to the round:

$$\begin{aligned}
 &(\text{Price of } (2, 0) \text{ in } R3) - (\text{Price of } (2, 0) \text{ in } R2) \leq (\text{Price of } (1, 1) \text{ in } R3) - (\text{Price of } (1, 1) \text{ in } R2) \\
 &(\$2,500,000 - \$2,400,000) \leq (\$2,050,000 - \$1,850,000) \\
 &\$100,000 \leq \$200,000
 \end{aligned}$$

11. The price of package (2, 0) increased by \$100,000 from Round 2 to Round 3, whereas the price of package (1, 1) increased by \$200,000. Therefore, the constraint is satisfied and Bidder A is permitted to place the bid on the package (2, 0).

Round 4

12. In Round 4, the price of C1/C2 increases to \$1,400,000, whereas the price of D/E increases to \$1,000,000. The price of a package with two C1/C2 licences is \$2,800,000, whereas the price of a package with one C1/C2 licence and one D/E licence is \$2,400,000. This price difference is only \$400,000 so Bidder A prefers the same package as in Round 3:

Category	Price	Bid	Eligibility Points
C1/C2	\$1,400,000	2	100
D/E	\$1,000,000	0	0
Total Package	\$2,800,000	(2, 0)	100 (Eligibility is 75)

13. Bidder A's eligibility is still only equal to 75, so it must meet the revealed preference constraint in order to place this bid. As before, the requirement is that the (2, 0) package needs to be relatively cheaper than the (1, 1) package (as compared to Round 2):

$$\begin{aligned}
 &(\text{Price of } (2, 0) \text{ in } R4) - (\text{Price of } (2, 0) \text{ in } R2) \leq (\text{Price of } (1, 1) \text{ in } R4) - (\text{Price of } (1, 1) \text{ in } R2) \\
 &(\$2,800,000 - \$2,400,000) \leq (\$2,400,000 - \$1,850,000) \\
 &\$400,000 \leq \$550,000
 \end{aligned}$$

14. This constraint continues to be satisfied, that is, the price of the package (2, 0) increased by \$400,000 which is no more than the increase in the price of the package (1, 1) from Round 2 to the current round, Round 4, which is \$550,000. Bidder A is permitted to place this bid for the package (2, 0).

Round 5

15. In Round 5, the price continues to increase on both categories, with C1/C2 at \$1,650,000 and D/E at \$1,200,000. As a result, both of the two-licence combinations, (2, 0) and (1, 1) now exceed Bidder A's budget of \$2,800,000. Bidder A must decrease its demand to one licence. As the price of C1/C2 (\$1,650,000) is \$450,000 greater than the price of D/E (\$1,200,000), Bidder A places a bid on one C1/C2 licence, package (1, 0), given that Bidder A prefers one C1/C2 licence when the price of one C1/C2 licence exceeds the price of one D/E licence by less than \$500,000.

16. This bid further reduces Bidder A's eligibility to 50 points. Bidder A is within its eligibility of 75 points, so there are no revealed preference constraints on this bid.

Category	Price	Bid	Eligibility Points
C1/C2	\$1,650,000	1	50
D/E	\$1,200,000	0	0
Total Package	\$1,650,000	(1, 0)	50

Round 6

17. In Round 6, the price on C1/C2 increases at a faster rate, increasing the price difference to \$550,000, which is greater than the \$500,000 threshold. Bidder A thus switches its bid to one D/E licence, package (0, 1), as Bidder A prefers one D/E licence when the price of one C1/C2 licence exceeds the price of one D/E licence by more than \$500,000. This bid further reduces Bidder A's eligibility to 25 points:

Table 6 — Round 6			
Category	Price	Bid	Eligibility Points
C1/C2	\$1,800,000	0	0
D/E	\$1,250,000	1	25
Total Package	\$1,250,000	(0, 1)	25

Round 7

18. In Round 7, the price of D/E increases at a faster rate than C1/C2. At Round 7 prices, Bidder A prefers one C1/C2 licence, as the price of one C1/C2 licence exceeds the price of one D/E licence by less than \$500,000, causing Bidder A to again desire to switch:

Table 7 — Round 7			
Category	Price	Bid	Eligibility Points
C1/C2	\$1,850,000	1	50
D/E	\$1,400,000	0	0
Total Package	\$1,850,000	(1, 0)	50 (Eligibility is 25)

19. In order to place this bid, Bidder A must satisfy revealed preference with respect to every round in which it has reduced its eligibility. Bidder A reduced its eligibility in Round 2, Round 5 and Round 6. It is helpful to summarize the prices, Bidder A's eligibility and its bids placed up to this point:

Table 8 — Summary							
Category	Price						
	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7
C1/C2	\$1,000,000	\$1,200,000	\$1,250,000	\$1,400,000	\$1,650,000	\$1,800,000	\$1,850,000
D/E	\$600,000	\$650,000	\$800,000	\$1,000,000	\$1,200,000	\$1,250,000	\$1,400,000
Bid	(2, 0)	(1, 1)	(2, 0)	(2, 0)	(1, 0)	(0, 1)	(1, 0)
Eligibility	100	100	75	75	75	50	25
Activity	100	75	100	100	50	25	50

20. The constraints are as follows:

Constraint with respect to Round 2

$$\begin{aligned}
 & (\text{Price of } (1, 0) \text{ in R7}) - (\text{Price of } (1, 0) \text{ in R2}) \leq (\text{Price of } (1, 1) \text{ in R7}) - (\text{Price of } (1, 1) \text{ in R2}) \\
 & (\$1,850,000 - \$1,200,000) \leq (\$3,250,000 - \$1,850,000) \\
 & \$650,000 \leq \$1,400,000
 \end{aligned}$$

21. The price of the package (1, 0) increased by \$650,000 from Round 2 to the current round, Round 7, which is no more than the increase in the price of package (1, 1), \$1,400,000, where package (1, 1) is the package that Bidder A bid on in Round 2.

Constraint with respect to Round 5

$$\begin{aligned} & (\text{Price of } (1, 0) \text{ in } R7) - (\text{Price of } (1, 0) \text{ in } R5) \leq (\text{Price of } (1, 0) \text{ in } R7) - (\text{Price of } (1, 0) \text{ in } R5) \\ & (\$1,850,000 - \$1,650,000) \leq (\$1,850,000 - \$1,650,000) \\ & \$200,000 \leq \$200,000 \end{aligned}$$

22. The price of the package (1, 0) increased by \$200,000 from Round 5 to the current round, Round 7, which is no more than the increase in the price of the package (1, 0), where the package (1, 0) is the package that Bidder A bid on in Round 5.

Constraint with respect to Round 6

$$\begin{aligned} & (\text{Price of } (1, 0) \text{ in } R7) - (\text{Price of } (1, 0) \text{ in } R6) \leq (\text{Price of } (0, 1) \text{ in } R7) - (\text{Price of } (0, 1) \text{ in } R6) \\ & (\$1,850,000 - \$1,800,000) \leq (\$1,400,000 - \$1,250,000) \\ & \$50,000 \leq \$150,000 \end{aligned}$$

23. The price of the package (1, 0) increased by \$50,000 from Round 6 to the current round, Round 7, which is no more than the increase in the price of the package (0, 1), where the package (0, 1) is the package that Bidder A bid on in Round 6.

24. All three revealed preference constraints are satisfied, so Bidder A is permitted to place this bid.

Supplementary Round

25. In Round 7, the aggregate demand drops sufficiently that the clock rounds conclude, making Round 7 the final clock round. Bidder A is in the position of having a final clock package of one C1/C2 licence. Note that if there had only been an eligibility point activity rule in the clock stage, Bidder A would likely have a less desirable final clock package of one D/E licence.

Revealed Preference Constraints for the (1, 1) Package

26. Now, suppose that Bidder A wishes to increase its bid on the package (1, 1) (i.e. one C1/C2 licence and one D/E licence) to its maximum budget of \$2,800,000. This package is worth 75 eligibility points, which exceeds Bidder A's eligibility of 25 eligibility points in the final clock round. Therefore, Bidder A must satisfy revealed preference with respect to the final clock round as well as with respect to each eligibility-reducing round beginning with the last round in which Bidder A had sufficient eligibility to bid on the package (1, 1). The last round in which Bidder A had sufficient eligibility to bid on the package (1, 1) was Round 5 and it subsequently reduced eligibility in Round 6. Therefore, Bidder A's supplementary bid on the package (1, 1) must meet the revealed preference constraints with respect to Round 5, Round 6 and Round 7.

27. The revealed preference constraints are as follows:

Revealed preference with respect to Round 5

$$\begin{aligned} & (\text{Sup Bid on } (1, 1)) - (\text{Price of } (1, 1) \text{ in R5}) \leq (\text{Highest Bid on } (1, 0)) - (\text{Price of } (1, 0) \text{ in R5}) \\ & (\text{Sup Bid on } (1, 1)) \leq (\text{Highest Bid on } (1, 0)) + (\text{Price of } (1, 1) \text{ in R5}) - (\text{Price of } (1, 0) \text{ in R5}) \\ & (\text{Sup Bid on } (1, 1)) \leq \$1,850,000 + \$2,850,000 - \$1,650,000 \\ & (\text{Sup Bid on } (1, 1)) \leq \$3,050,000 \end{aligned}$$

Revealed preference with respect to Round 6

$$\begin{aligned} & (\text{Sup Bid on } (1, 1)) - (\text{Price of } (1, 1) \text{ in R6}) \leq (\text{Highest Bid on } (0, 1)) - (\text{Price of } (0, 1) \text{ in R6}) \\ & (\text{Sup Bid on } (1, 1)) \leq (\text{Highest Bid on } (0, 1)) + (\text{Price of } (1, 1) \text{ in R6}) - (\text{Price of } (0, 1) \text{ in R6}) \\ & (\text{Sup Bid on } (1, 1)) \leq \$1,250,000 + \$3,050,000 - \$1,250,000 \\ & (\text{Sup Bid on } (1, 1)) \leq \$3,050,000 \end{aligned}$$

Revealed preference with respect to Round 7

$$\begin{aligned} & (\text{Sup Bid on } (1, 1)) - (\text{Price of } (1, 1) \text{ in R7}) \leq (\text{Highest Bid on } (1, 0)) - (\text{Price of } (1, 0) \text{ in R7}) \\ & (\text{Sup Bid on } (1, 1)) \leq (\text{Highest Bid on } (1, 0)) + (\text{Price of } (1, 1) \text{ in R7}) - (\text{Price of } (1, 0) \text{ in R7}) \\ & (\text{Sup Bid on } (1, 1)) \leq \$1,850,000 + \$3,250,000 - \$1,850,000 \\ & (\text{Sup Bid on } (1, 1)) \leq \$3,250,000 \end{aligned}$$

28. Without submitting a supplementary bid increasing the amount bid for its final clock package (1, 0) or for the (0, 1) package, the highest supplementary bid that Bidder A can place on the (1, 1) package is \$3,050,000, allowing Bidder A to place the \$2,800,000 bid.

Revealed Preference Constraints for the (0, 1) Package

29. The (0, 1) package is also subject to revealed preference constraints. In this example, the last round in which Bidder A had sufficient eligibility to bid on the (0, 1) package was Round 7, which is also the final clock round. So, the only constraint on the bid for the (0, 1) package is:

$$\begin{aligned} & (\text{Sup Bid on } (0, 1)) - (\text{Price of } (0, 1) \text{ in R7}) \leq (\text{Highest Bid on } (1, 0)) - (\text{Price of } (1, 0) \text{ in R7}) \\ & (\text{Sup Bid on } (0, 1)) \leq (\text{Highest Bid on } (1, 0)) + (\text{Price of } (0, 1) \text{ in R7}) - (\text{Price of } (1, 0) \text{ in R7}) \\ & (\text{Sup Bid on } (0, 1)) \leq \$1,850,000 + (\$1,400,000 - \$1,850,000) \\ & (\text{Sup Bid on } (0, 1)) \leq \$1,400,000 \end{aligned}$$

30. So, without submitting a supplementary bid to increase the amount bid for its final clock package, the highest supplementary bid that Bidder A can place on the (0, 1) package is \$1,400,000 because Bidder A bid \$1,850,000 for (1, 0) in the final clock round. However, if Bidder A places a supplementary bid on its final clock package of \$2,300,000, then Bidder A may also place a supplementary bid on the (0, 1) package of up to \$1,850,000.

Annex D – Algebraic Description of the Revealed Preference Activity Rules in the Clock Rounds and the Supplementary Round

Revealed Preference in the Clock Rounds

1. Under the activity rule in the clock rounds, a bidder may, at any time during the clock rounds, place a bid on any package that is within its current eligibility. As well, in any round, the bidder can bid on a larger package than would be permitted by the bidder's current eligibility provided that the package satisfies revealed preference with respect to each prior eligibility-reducing round and as long as the bidder still has some eligibility points. However, bidding on a larger package does not increase the bidder's eligibility in subsequent rounds. A bidder will never be allowed to place a bid on a package that exceeds its initial eligibility.
2. A product refers to a particular category in a given service area. There will be 56 products in the 700 MHz auction representing the four categories of licences, block A, blocks B and C, blocks D and E and blocks C1 and C2 in each of the 14 Tier 2 service areas.
3. As per the equation below, a package in clock round t satisfies revealed preference with respect to an earlier clock round s for a given bidder if the bidder's package Q_t has become relatively less expensive than the package on which the bidder bid in clock round s , Q_s , as the clock prices have progressed from the clock prices in clock round s to the clock prices in clock round t . Algebraically, the revealed preference constraint is the condition that:

$$\sum_{i=1}^m (Q_{t,i} \times (P_{t,i} - P_{s,i})) \leq \sum_{i=1}^m (Q_{s,i} \times (P_{t,i} - P_{s,i}))$$

where:

- “ i ” indexes the products;
- “ m ” is the number of products, where the number of products for the 700 MHz auction is 56;
- $Q_{t,i}$ is the quantity of the i^{th} product bid in clock round t ;
- $Q_{s,i}$ is the quantity of the i^{th} product bid in clock round s ;
- $P_{t,i}$ is the clock price of the i^{th} product bid in clock round t ; and
- $P_{s,i}$ is the clock price of the i^{th} product bid in clock round s .

4. A bidder's package, Q_t , of clock round t is consistent with revealed preference in the clock rounds if it satisfies the revealed preference constraint with respect to all eligibility-reducing rounds prior to clock round t for the given bidder.

Revealed Preference in the Supplementary Round

5. There is no limit on the supplementary bid amount for the final clock package. This exception also applies where a bidder's final clock package exceeded its eligibility in the final clock round due to the revealed preference activity rule.

6. All supplementary bids must satisfy revealed preference with respect to the final clock round regardless of whether the supplementary bid package is smaller or larger, in terms of eligibility points, than the bidder's eligibility in the final clock round.
7. In addition, supplementary bids for packages that exceed the bidder's eligibility in the final clock round must satisfy revealed preference with respect to the last clock round in which the bidder was eligible to bid on the package and every subsequent clock round in which the bidder reduced eligibility.
8. Let Q denote the package on which the bidder wishes to place a supplementary bid. Let Q_s denote the package on which the bidder bid in clock round s and let B_s denote the bidder's highest dollar amount bid in the auction on package Q_s , whether the highest dollar amount was placed in a clock round or the supplementary round.
9. A supplementary bid B on package Q satisfies revealed preference with respect to a clock round s , if B is less than or equal to the highest dollar amount bid on the package bid in clock round s , *that is*, B_s plus the price difference in the respective packages, Q and Q_s , using the clock prices of clock round s . Algebraically, the revealed preference limit is the condition that:

$$B \leq B_s + \sum_{i=1}^m (P_{s,i} \times (Q_i - Q_{s,i}))$$

where:

“ i ” indexes the products;

“ m ” is the number of products;

Q_i is the quantity of the i^{th} product in package Q ;

$Q_{s,i}$ is the quantity of the i^{th} product in package Q_s of clock round s ;

$P_{s,i}$ is the clock price of the i^{th} product in clock round s ;

B is the dollar amount of the supplementary bid on package Q ; and

B_s is the highest dollar amount bid on package Q_s either in a clock round or in the supplementary round.

10. In addition, for supplementary bid package Q , let $T(Q)$ denote the last clock round in which the bidder's eligibility was at least the number of eligibility points associated with package Q .
11. A given bidder's collection of supplementary bids is consistent with the revealed preference limit if the supplementary bid for package Q , with a dollar amount B for the given bidder satisfies the following condition:
- (a) for any package Q , the dollar amount B must satisfy the revealed preference constraint, as specified in paragraph 8 above with respect to the final clock round and with respect to every eligibility-reducing round equal to $T(Q)$ or later.

12. Note that, in the application of paragraph 8, the package Q_s may itself be subject to a revealed preference constraint with respect to another package. Thus, the rule may have the effect of creating a chain of constraints on the dollar amount of a supplementary bid for a package Q relative to the dollar amounts of other clock bids or supplementary bids.
13. See Annex C for an example of the revealed preference limit in the supplementary round.

Annex E – Pricing Rules

1. Prices are determined at two points in the auction: first, at the end of the allocation stage to determine the base prices, which are the minimum that winning bidders will pay for their winning packages; and second, at the end of the assignment stage to determine the incremental payments for specific licences, known as assignment prices. Industry Canada will use a second-price rule to determine the prices to be paid by winning bidders. More specifically, Industry Canada will apply bidder-optimal core prices and to use the “nearest Vickrey” approach in determining both the base prices and the assignment prices. The final price paid by a winning bidder is the sum of the base price and the assignment price(s).

Base Prices

2. Each winning allocation stage bid has an associated price for the package of licences contained within the bid, known as the base price. A separate base price is determined for each winning bidder.
3. A second-price rule will be used to calculate base prices such that the base price for a winning bidder will be at least the opening bid price, but no higher than the actual amount bid. Second prices are often referred to as Vickrey prices and represent the individual opportunity cost of the bidder winning the package.
4. The Vickrey price for each winning Bidder J is calculated as follows. First, from the value of the winning combination of packages, subtract Bidder J’s winning bid (value A). Next, recalculate the winning combination of packages for the hypothetical situation in which all of Bidder J’s bids are excluded, as if Bidder J had not participated (Value B). The Vickrey price for Bidder J is calculated as the value of the winning combination of packages with all Bidder J’s bids excluded (value B) minus the sum of the winning allocation stage bids for all bidders other than Bidder J (value A); that is, B-A. This determines the minimum amount that the winning bidder could have bid and still have won the package, given the bids of all other bidders.
5. An extra payment beyond the Vickrey prices is sometimes required as a result of complementarities. In the event that an extra payment is required, the payment to be made will be adjusted so that it is proportionate to the size of the bidder’s package as measured by the bidder’s winning package evaluated at the opening bid prices.
6. The set of base prices for the winning allocation stage bids must satisfy the following conditions:
 - (a) **First condition:** The base price for a winning allocation stage bid must be greater than or equal to the opening bid prices for the licences included in the package associated with the winning bid, but not more than the dollar amount of the winning bid.

- (b) **Second condition:** The set of base prices must be sufficiently high that there is no alternative bidder, or group of bidders prepared to pay more than any winning bidder or group of winning bidders. If there is only one set of base prices that meets the first and second conditions, this determines the base prices for the allocation stage.
- (c) **Third condition:** If there is more than one set of base prices that fulfils the first and second conditions, the set (or sets) of base prices minimizing the sum of base prices across winning bidders is (are) selected. If there is only one set of base prices satisfying these three conditions, this set determines the base prices for the allocation stage.
- (d) **Fourth condition:** If there is more than one set of base prices that satisfies the first three conditions, the set of base prices that minimize the weighted sum of squares of differences between the base prices and the Vickrey prices will be selected. The weighting is relative to the price of the bidder's package evaluated at the opening bid prices. This approach for selecting among sets of base prices that minimize the sum of base prices across winning bidders is referred to as the "nearest Vickrey" approach.
7. These conditions characterize a unique set of base prices such that each winning bidder pays no more than the dollar amount of its winning bid and pays at least the aggregate value of the opening bid prices for the package of licences.
8. A software algorithm will be used to determine the set of base prices that meets the conditions outlined above.
9. The following is an example of how base prices are calculated. This example is based on the *Spectrum Auction Design* paper by P. Cramton (<http://www.cramton.umd.edu/papers2005-2009/cramton-spectrum-auction-design.pdf>).

Suppose that there are five bidders, 1, 2, 3, 4, 5, bidding for two licences, A and B. The following bids are submitted ("b" designates the bidder):

$$b_1\{A\} = \$28$$

$$b_2\{B\} = \$20$$

$$b_3\{AB\} = \$32$$

$$b_4\{A\} = \$14$$

$$b_5\{B\} = \$12$$

The bids of the five bidders are represented in Figure 2.

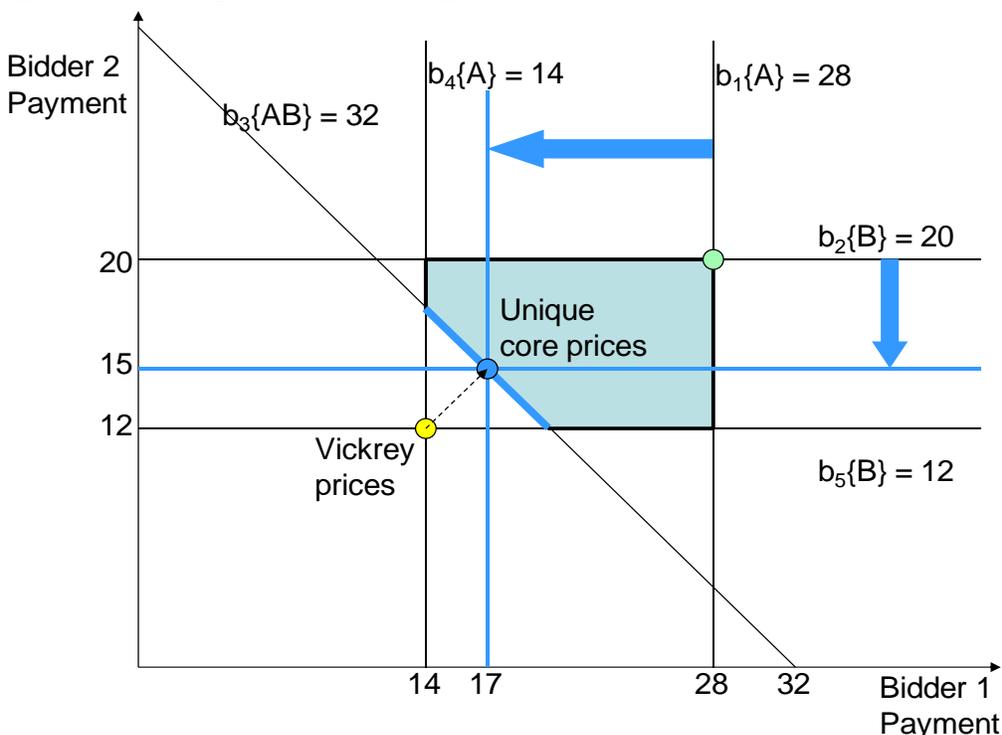
In this example, the highest value combination of bids would assign licence A to Bidder 1 and licence B to Bidder 2, generating \$48 in value. There is no other assignment of the licences that yields a higher value.

To calculate the Vickrey price for Bidder 1, its winning bid (\$28) is subtracted from the value of the winning combination (\$48), resulting in \$20. Next, the winning combination of packages is recalculated for the hypothetical situation in which Bidder 1's bids are excluded. The best assignment, excluding Bidder 1, assigns licence A to Bidder 4 at \$14 and licence B to Bidder 2 at \$20, resulting in \$34. The Vickrey price for Bidder 1 is the value of the winning combination of packages with all Bidder 1's bids excluded (\$34) less the sum of the winning allocation stage bids for all bidders other than Bidder 1 (\$20), that is, its Vickrey price is \$14 (\$34 – \$20).

Similarly, to calculate the Vickrey price for Bidder 2, its winning bid (\$20) is subtracted from the value of the winning combination (\$48), resulting in \$28. Next, the winning combination of packages is recalculated for the hypothetical situation in which Bidder 2's bids are excluded. The best assignment, excluding Bidder 2, assigns licence A to Bidder 1 and licence B to Bidder 5, resulting in a value of \$40. The Vickrey price for Bidder 2 is the value of the winning combination of packages with all Bidder 2's bids excluded (\$40) less the sum of the winning allocation stage bids for all bidders other than Bidder 2 (\$28), that is, its Vickrey price is \$12 (\$40 – \$28).

Hence, the Vickrey outcome is for Bidder 1 to pay \$14 for licence A and for Bidder 2 to pay \$12 for licence B. Total revenues with these payments are $\$14 + \$12 = \$26$. As shown in Figure 2, this means that Bidder 1 can reduce its bid to \$14 before being displaced by Bidder 4. Similarly, Bidder 2 can reduce its bid to \$12 before being displaced by Bidder 5.

However, these payments sum to \$26, which is less than Bidder 3's bid of \$32 for both licences A and B. Therefore, Bidder 1 and Bidder 2 must split an additional payment of \$6 ($\$32 - \26), to ensure that their combined payment is greater than that of Bidder 3, satisfying the condition that no other bidder or group of bidders were prepared to pay more for the licences in question. That is, Bidder 1 and Bidder 2 must pay, collectively, at least \$32.

Figure 2 – Example of Calculating Base Prices

If the opening bid prices for licence A and licence B are the same amount, the additional payment of \$6 is split equally between the two bidders. Each bidder is therefore paying an additional \$3 above its Vickrey price, with Bidder 1 paying \$17 (\$14 + \$3) and Bidder 2 paying \$15 (\$12 + \$3), as shown in Figure 2.

However, if the opening bid prices for the two licences are different amounts, the two bidders must split the extra payment proportionately, in reference to the opening bid amounts (the fourth condition). For example, if the opening bid price for licence A is \$8 and the opening bid price for licence B is \$4, then the opening bid price of Bidder 1's package is twice as large as that of Bidder 2. Therefore, Bidder 1 would pay twice as much as Bidder 2 of the extra payment, with Bidder 1 paying an additional \$4, for a total payment of \$18 and Bidder 2 paying an additional \$2, for a final payment of \$14.

Assignment Prices

10. Industry Canada will run three sequential assignment rounds, if necessary, one for each category of generic licences, blocks B and C, blocks D and E and blocks C1 and C2. This is to allow bidders that have won licences in the same category of generic licences across multiple service areas to have the opportunity to express their preference for particular licences.
11. The assignment bid is essentially a package bid for the locations of all licences within a category. For each category that includes two generic licences, that is, blocks B and C, blocks D and E and blocks C1 and C2, assignment prices will be determined from the set of assignment stage bids for the category of licences.

12. A second-price rule will be used to calculate assignment prices. The assignment price is attributable to the entire collection of licences assigned within a given assignment round and not to individual licences that comprise the package. For example, if a bidder wins one B/C licence nationwide, in the B/C assignment, round the bidder is able to submit multiple bids to be assigned specific licences in every service area. In this case, the assignment price is for the group of licences rather than the specific licence in each service area.
13. For the purpose of calculating assignment prices, the Vickrey price for each winning Bidder J is calculated as follows. First, from the value of the winning combination of assignment bids, subtract Bidder J's winning bid (value A). Next, recalculate the winning combination of assignment bids in the hypothetical situation where all Bidder J's assignment bids are equal to zero, as if Bidder J did not have a preference for any of the assignment options that it was presented in the round (value B). The Vickrey price for Bidder J is defined as the value of the winning combination of assignment bids with all Bidder J's bids set to equal zero (value B) minus the sum of the winning assignment bids for all bidders other than Bidder J (value A), that is, $B - A$.
14. The assignment stage prices for each winning assignment bid must satisfy the following conditions:
 - (a) **First condition:** The assignment prices must be greater than or equal to zero, and not more than the dollar amount of the winning assignment stage bid.
 - (b) **Second condition:** The set of assignment prices must be sufficiently high that there is no alternative combination of valid assignment bids that sum to more than the winning assignment bids. If there is only one set of assignment prices that satisfies the first two conditions, this determines the assignment prices.
 - (c) **Third condition:** If there are many sets of assignment prices that fulfil the first and second conditions, the set (or sets) of assignment prices minimizing the sum of assignment prices across winning assignment stage bids is (are) selected. If there is only one set of assignment prices that satisfies these three conditions, this determines the assignment prices.
 - (d) **Fourth condition:** If there are many sets of assignment prices that satisfy the first three conditions, the set of assignment prices that minimizes the weighted sum of squares of differences between the assignment prices and the Vickrey prices will be selected. The weighting is relative to the price of the bidder's package evaluated at the opening prices. This approach for selecting among sets of assignment prices that minimize the sum of assignment prices across winning assignment bids is referred to as the "nearest Vickrey" approach.
15. A software algorithm will be used to determine the set of assignment prices that meet the conditions outlined above.